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BRITISH TRANSPORT DIRECTORY OF OFFICIALS

A revised list of members of the Ministry of Transport, the British Transport Commission, and its Executives is now obtainable from the Publishers, "The Railway Gazette," 33, Tothill Street, Westminster, S.W.1. Price 1s.

OVERSEAS RAILWAYS 1948

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THE RAILWAY GAZETTE

33, TOTHILL STREET, WESTMINSTER, S.W.1

Tribunal to Advise on Wage Dispute

AN urgent request has been addressed to the National Arbitration Tribunal by the Minister of Labour for advice as to whether the joint machinery now available to the railway industry provides a suitable means for settling the present wage dispute which arose from rejection of the claim by the National Union of Railwaymen for a weekly wage increase of 12s. 6d. Existing machinery consists of the Railway Staff National Council and the Railway Staff National Tribunal. The position has been complicated by the fact that there are four separate—though similar—claims and that by no means all the employees are members of the N.U.R. The dispute as it affects the Docks & Inland Waterways Executive, which considers itself covered by the railway procedure, will be dealt with in the light of advice given by the Tribunal in the case of the Railway Executive and London Transport. There is no machinery in existence for dealing with the Hotels Executive side of the dispute, and this has, therefore, been referred to the N.A.T. for settlement under the National Arbitration Order. A full panel of the National Arbitration Tribunal met in private on Wednesday to consider the matter, and will report direct to the Minister, who may issue his decision in the form of a White Paper.

* * * *

M. Robert Le Besnerais

By the death of Monsieur Robert Le Besnerais, which we record elsewhere in this issue, the railways of Europe have lost an outstanding figure. For rather over seven years, a period of unexampled difficulty, he was Director-General of the French National Railways, and was responsible, in 1938, for welding the several companies and State-owned lines into one cohesive whole as a national undertaking. After only a decade of service with the Nord Railway he had been appointed as its chief executive, on the retirement of Monsieur Paul Javary, a man whom it was far from easy to succeed. The present efficiency of the French National Railways is, in large part, due to the plans laid by M. Le Besnerais in 1938 and 1939. The war, with its German occupation, held up the fruition of many of those plans, but the manner in which he faced the grievous problems of the occupation, protecting his staff and, at the same time, paving the way for the liberation of his railways and his country, ensures him a lasting place in the history of the railway industry, which was his life, and which he did so much to adorn.

* * * *

C.I.E. Directors' Comments on Milne Report

The Stockholders' Directors of Coras Iompair Eireann (Irish Transport Company) have issued a circular to stockholders commenting on Sir James Milne's report on transport in Ireland. They do not support the view in the report that the requirements of Ireland do not warrant the introduction of diesel-electric locomotives and they are critical of the recommendations relating to branch lines. The Stockholders' Directors declare that these lines are completely uneconomic and can never be operated at anything but a heavy loss, whereas if replaced by road services the latter could be run on an economic basis. The circular points out that the most important part of the report, from a stockholder's point of view, is the restriction to be placed on private road goods transport. In Ireland there are not sufficient customers for both road and rail. The suggested two rates of licence duty, and other suggestions in the report relating to road transport, do not commend themselves to the Stockholders' Directors, nor do those dealing with financial provisions, the curtailment of certain items of capital expenditure, or the acquisition of the Grand Canal Company. Extracts from the circular are given on page 52.

* * * *

The Canadian Railways in 1948

The statements for the past year by the heads of the Canadian Pacific and Canadian National Railways, which are summarised elsewhere in this issue, tell a now familiar story of ever-mounting costs of materials and wages nullifying record earnings. It is shown that since 1939 on the Canadian Pacific

materials have increased by 65 per cent. and wages by 70 per cent. The freight increase of 21 per cent. which was granted during the year—the first for a quarter of a century—was only partial compensation, and falls far short of those granted to United States railways. Applications for further increases are pending before the Board of Transport Commissioners. Nevertheless, the two great systems, which occupy a leading place in the economy of the Dominion and are so closely bound up with its development and welfare, are doing their utmost to provide improved services at a period when, paradoxically, although their own financial condition is so unsatisfactory, the national income and employment are at the highest levels and industrial output is expanding rapidly. The Canadian Pacific last year floated a \$20,000,000 equipment trust issue, funds from which are going towards the purchase of new equipment which is required to bridge the gap until the company's finances improve. Air routes spanning the Pacific are planned by the C.P.R., and both companies in the past twelve months have made important additions to their already large steamship fleets.

* * * *

East African Transport Plans

Meetings were held at the Colonial Office last week to consider general transport problems in East Africa, and reports were received from Tanganyika at the same time, giving details of a revised plan for developing the groundnut areas of southern Tanganyika during the next six years. The new port of Mikindani is not likely to be ready for at least another three years, and, therefore, work has been begun on a new supply line to the Nachingwea forward groundnut area, eight miles up the river from the port of Lindi. From this point inland the main link will be a railway which is expected to be completed by the end of June. Work is to be speeded up by employing mechanical equipment in place of manual labour. This railway will be 80 miles in length and will be supplemented by a road. Another railway now under construction from Mikindani will run inland for 70 miles to join the Lukeledi line and give the groundnut area the use of both ports. The plan also calls for a heavy bridging programme. These developments were referred to in an editorial article in our December 10, 1948, issue. On the more general question of long-term development the proposals for surveying alternative routes to provide a railway link between the Rhodesian and East African railway systems and the route from Broken Hill to Mikindani are in an advanced stage. The former is to be a comprehensive engineering survey and the latter will be a quick reconnaissance designed to ascertain whether the proposed route is likely to be a practicable proposition.

* * * *

British Transport Directory of Officials

By reason of the frequent changes which have occurred in the various units of the British Transport system—railways, road transport, docks, canals, hotels—during their reorganisation under the British Transport Commission, no annual work of reference could maintain adequately a reasonably accurate record of the current holders of important office, or even of the titles and scope of such office. Reorganisation schemes are being implemented from day to day, and involve changes in the location, office, and designation of many well-known personalities in the transport world, and, to meet this situation, *The Railway Gazette* issued a "British Transport Directory of Officials" at the beginning of nationalisation. This has been revised from time to time, and re-issued, and we know from our correspondents and from our many contacts among transport officers that this Directory has been appreciated very widely. In fact, blocks of copies have been ordered by the various Executives, for their own internal needs. It is, therefore, with pleasure that we are able to present readers this week with a further revised edition, corrected officially up to January 1, and one Directory is included with every copy of this week's issue of *The Railway Gazette*. In addition, we have available a very limited number of separate copies of the Directory which may be purchased from the Publisher, price 1s.

Railway Construction under Difficulties

The first Spanish railway, from Barcelona to Mataró, which celebrated its centenary last October, was built by English engineers under conditions of considerable opposition. Work was begun in February, 1847, on a line skirting the shore, with but one short tunnel (at Mongat) and few technical problems. The difficulties came from the landowners, from fishermen who feared for their access to the beaches, and from shipping interests who foresaw a decline in their trade between Barcelona and Mataró. Several times the works were set on fire, workmen were menaced, and the English engineers felt compelled to place armed sentinels along the completed sections of line. William Locke, the Chief Engineer, was attacked in August, 1847, whereupon he notified the company of his determination to abandon the work. In fact, not till November was building resumed, and then under the armed protection of the "Guardia Civil." Nevertheless, several wooden bridges were burned subsequently, and trains conveying building materials were derailed. When the railway, crossing the line of fortifications to the north of Barcelona, was ready, the military authorities raised objections, fearing that insurgents (in 1848 another Carlist revolution was in progress) might penetrate into the town by way of the cut used by the railway. An iron gate had to be erected and kept shut during the night, and the key deposited with the military governor.

* * * *

Longest British Non-Stop Runs

Until now, the fact appears to have escaped comment that during the period when the East Coast main line was out of action between Berwick and Dunbar, after the disastrous washouts of August last, certain very notable operating records were made. Although main-line traffic was diverted by way of Galashiels, St. Boswells, and the Kelso branch, and so incurred the long climb to Falahill summit, 900 ft. above sea level, the "Flying Scotsman" nominally ran on its non-stop schedule. At first, however, it was the practice to stop at Hardengreen, going south, for banking assistance, and at Tweedmouth for water, but on September 7, the climb to Falahill was made unassisted, and the engine handled the train so economically that, as Tweedmouth was approached well over 2,000 gal. of water remained in the tender and the Tweedmouth stop was not necessary. On the following day, a similar performance was made in the northbound direction, and on eight different days between September 7 and 18 inclusive, runs were made, in one direction or the other, without any stop. We believe that on most of these days, the train was not stopped south of Tweedmouth, so that on such occasions the "Flying Scotsman" made the longest non-stop run—408.5 miles—ever achieved on British metals, as noteworthy a feat of railway operation as it was of locomotive endurance and handling.

* * * *

Power Signalling at Doncaster

On Sunday, last, January 9, British Railways, Eastern Region, brought into use the new power-operated signal box at the south end of Doncaster Station. It is expected that a similar signal box, controlling movements at the north end of the station, will be completed towards the end of February. The introduction of colour-light signalling, and power-operated points, will effect a great improvement in the handling of the heavy traffic through this focal point on the main-line from London to the North, and will displace six mechanically-operated signal boxes. The panels in the new signal boxes show the track layout in diagram form, and the switches are located to correspond with the position of the signal they control. Red and green lamps adjacent to the switches indicate the signal aspects, and illuminated indicators show the position of points, and the occupation of track circuits. Sequence switch interlocking of a new design, developed by Standard Telephones & Cables Limited, has been adopted in the new installation, and the operation of this innovation will be watched with interest by railway signalling engineers throughout the world.

Track Distorted by Heat

A summary of Brigadier C. A. Langley's report on the derailment near Wath Road Junction, London Midland Region, on May 18, 1948, appears in this issue and it will be seen that the cause was severe distortion of the track in hot weather. The track was laid in ash ballast on an embankment, in a mining district. Local conditions contributed to make the results of the train leaving the rails much worse than might otherwise have been the case and also hampered the extrication of the casualties. Maintenance of the track, admittedly much handicapped by staff troubles, was not up to the standards demanded by a high-speed main line, and there appeared to be insufficient appreciation among those concerned of the need for loosening fishplates during hot weather and particularly at the onset thereof. Brigadier Langley witnessed some tests conducted for the purpose of comparing the ability of different types and conditions of ballast to resist the lateral forces set up when tight, or butting joints have suppressed the expansion and the rails have become highly stressed. He recommends that research into this problem should be continued with the idea of arriving at some reliable and reasonably accurate data on this important matter.

* * * * *

Steam Locomotive Efficiency in New South Wales

Evidence of the steady progress that has been made in improving the efficiency of the New South Wales Government Railways locomotive stock over some 15 years was contained in a recent issue of the *Commonwealth Engineer*. During 1946-47, the 983 locomotives in service each ran an average of 34,492 miles, and it is stated that coal consumption was 1,329,834 tons, which is equivalent to 3.48 oz. of coal for each ton-mile in steam service and compares with an equivalent figure of 4.32 oz. for the year ended June 30, 1929. Despite exacting operating conditions, the dependability of the locomotive stock was satisfactory during 1946-47, when the engine miles run per casualty were 62,673 and for each failure were 167,024. In New South Wales, a casualty is recorded when time in excess of 5 min. is lost by passenger or mixed train, as a result of locomotive causes, and a failure is registered when it is necessary to change a locomotive between depot stations.

* * * * *

B.T.C. Traffic Receipts for 1948

TRAFFIC receipts of the British Transport Commission for the 52 weeks of 1948 ended December 26 last, amounted to £391,583,000, a rise of £38,973,000 compared with 1947. Increases were recorded by all sections of transport operated by the Commission. Gross takings from main-line railways totalled £332,548,000, compared with £298,370,000 for the previous year. The rise in this section was therefore £34,178,000. It is important to note, however, that these figures are gross receipts and do not reflect variations in expenditure, which must be taken into account in arriving at net revenue. It has been estimated that the net deficit on the Commission's accounts for last year, after charging interest and meeting all other items, will be in the region of £20 million.

For 40 weeks of 1948 the railways obtained the benefit of a substantially higher level of passenger and freight charges than in 1947. The increases, which became operative on October 1, 1947, were expected to produce an increase of £65 million in gross revenue for 1948 compared with 1947. The traffic receipts now issued show that in fact the advance has been a little more than half that figure.

At the end of last year the railways, after making allowance for the annual rental of £43,500,000 payable under the control agreement, had a deficit of all but £60 million. The annual interest charge on British Transport Commission stocks is just over £30 million, and on this basis the deficit for 1948 would be about £36,500,000 less the £39 million increase in gross traffic. If these were the only factors to be taken into account it might be possible to look for a net revenue of about £2½ million for the year just ended.

It is known, however, that there have been very heavy increases in costs, both of labour and materials, and it is not possible to put a firm figure either on these or on any relatively

small economies which may have been effected by the Commission during the year to offset them. It is for this reason that a deficit for some £20 million is expected; when the full figures become available it may be an even larger figure. On the other hand, the possibility cannot be ruled out that the first year's total receipts of the Commission may provide a surprise for the orthodox by showing a smaller shortfall. It is unlikely, however, that the full account will be available for some three months in view of the desire to make them as informative as possible.

The following table gives details of traffic receipts for the four weeks ended December 26, 1948, and the aggregate for the 52 weeks of the year compared with similar periods of 1947:—

	Four weeks to December 26		Incr. or decr.	Aggregate to December 26		Incr. or decr.
	1948	1947		1948	1947	
	£000	£000	£000	£000	£000	£000
British Railways (receipts from railway working)	8,231	8,878	— 647	121,913	115,943	+ 5,970
Passengers	2,254	2,246	+ 8	29,222	26,520	+ 2,702
Parcels, etc., by passen- ger train	6,669	6,568	+ 101	85,039	76,813	+ 8,126
Merchandise & livestock ...	2,323	2,001	+ 322	29,171	22,279	+ 6,892
Minerals	5,404	4,849	+ 555	67,203	56,815	+ 10,388
Coal & coke	24,881	24,542	+ 339	332,548	298,370	+ 34,178
London Transport—						
Railways	1,163	1,123	+ 40	14,607	13,363	+ 1,244
Buses & coaches	2,253	2,260	— 7	31,486	28,799	+ 2,687
Trolleybuses & trams ...	826	832	— 6	11,213	10,507	+ 706
	4,242	4,215	+ 27	57,306	52,669	+ 4,637
Inland Waterways—						
Tolls	58	54	+ 4	763	639	+ 124
Freight charges, etc. ...	85	90	— 5	966	932	+ 34
	143	144	— 1	1,729	1,571	+ 158
Total	29,266	28,901	+ 365	391,583	352,610	+ 38,973

It will be seen from the above table that London transport finished the year with aggregate takings of £57,306,000, or £4,637,000 more than for the previous year. Inland Waterways brought in £158,000 more at £1,729,000.

* * * * *

The Railway Executive

AS announced last week the Minister of Transport, after consulting the British Transport Commission, has selected General Sir Daryl G. Watson to be a full time member of the Railway Executive in succession to General Sir William Slim. Wouldn't it have been fairer if the Navy had had the next turn? General Watson held important commands during the last war and in 1946-47 was Quartermaster General to the Forces. He will thus be familiar with Army transport arrangements, but these are specialised, and experience of their working can hardly be of much use to him in taking up his new post. He has passed the age of 60, at which railway officers are eligible for superannuation, and we cannot help feeling that the Government might with advantage have chosen someone at least 10 years younger for the vacant seat on the Railway Executive, especially as 3 of the original members are over 60.

The old railway companies were wise when they placed men between 40 and 50 years of age in charge of important departments. They could then count on getting from 10 to 15 years' service from an officer who had not fallen into a groove, but could strike out on fresh lines.

During the last 50 years, the men who did most to develop our railways made good early. To quote a few cases, Sir John Aspinall was General Manager of the Lancashire & Yorkshire at 45, Sir George Gibb of the North Eastern at 41, Sir Guy Granet of the Midland at 39, Sir Felix Pole and Sir James Milne of the Great Western at 44 and 45 respectively, while Lord Ashfield, Cecil Paget, Sir Herbert Walker, and Eric Geddes held important posts in their thirties. Today, more than ever, the principal executive officers require the liveliness of mind and the spark of imagination that are

apt to grow dim with the passing of the years. The men we have named had the gift of transmitting their own enthusiasm to such of their subordinates as possessed understanding, and so enterprise was fostered even in out of the way quarters. Today it is even more important that the Railway Executive possess a similar capacity for leadership.

There is the further point that the transfer of a General on the retired list to what is now the Mecca of the nationalised railway service must be discouraging to the many capable railway officers in all regions who are looking eagerly for promotion. The prospects of a considerable number have not been improved by the reorganisation of the four railway systems and it will be galling to these officers to hear that one of the top posts in the new hierarchy has been assigned to a retired Army officer who has not borne the heat and burden of a strenuous training in railway work.

* * * *

Main-Line Regrading in New South Wales

IN New South Wales, a marked feature of the goods traffic over the steeply-graded main lines is the great preponderance in the volume of "up" loads (towards Sydney) over "down." Trains running in the "down" direction are often largely composed of empty vehicles. Consequently, any regrading or re-locating of the track that has been necessary has mainly been intended to assist "up" or fully-loaded trains. Broadly speaking, this has resulted in the provision of a ruling grade of 1 in 75 uncompensated for curvature or its equivalent, against "up" trains, and the original 1 in 40 grades against "down" traffic have remained intact.

This general policy was implemented in the recent regrading and re-location of a section of the southern or Sydney-Albury main line, described elsewhere in this issue. The original single line, with its 1 in 40 ruling grade, has become the "down" line, and a new "up" line has been constructed on a different alignment and with a ruling grade of 1 in 66 compensated for curvature; roughly equivalent to 1 in 75 uncompensated.

On the principal routes of the New South Wales Government railways, the 2-8-0-type standard goods engine is now being replaced, as rapidly as limitations of track and structures permit, by the D-57 class, a modern and much more powerful three-cylinder 4-8-2-type locomotive. Before the doubling and relaying works, of which the re-location and regrading just mentioned were integral parts, the D-57 class had been allowed to run from Sydney only as far as Cootamundra, where the double line then ended. The loads hauled by these engines were 1,000 tons in the "up" direction, and 850 tons on "down" journeys. On the single line beyond Cootamundra, the heaviest goods engine permitted to run was the standard 2-8-0, which, with a through single load in the "up" direction of 640 tons, could haul only 340 tons up the 1 in 40 ruling grade, since replaced by 1 in 66 compensated. To work 640-ton trains up the 1 in 40, an assisting engine had to be attached, and the heavier passenger trains also had to be assisted up this 3½-mile bank. Lack of suitable water in the locality further increased the difficulties and cost of this method of working.

When increasing traffic necessitated the doubling of the line from Cootamundra onwards to Junee, the next junction beyond, there was therefore a strong case for simultaneously eliminating the 1 in 40 and other grades steeper than 1 in 75. If this could be achieved, it would not only enable D-57 class engines unaided to work 1,000-ton "up" loads throughout, but also C-38 and C-36 class locomotives to haul 460-ton and 390-ton passenger trains, respectively, through from Junee without banking assistance. The section of steeper than 1 in 75 grades was actually 3.4 miles in length, and, in order to obtain the required easier ruling grade, the length of line had to be increased to about 5 miles. The least costly method of easing the grade against "up" trains was, therefore, to build an entirely new "up" line, independent of the old alignment, which could then remain as the "down" track. This new five-mile "up" line had to be constructed in hilly country mostly composed of granite-like rock, and was bound to be costly. The problem was whether the advantages gained by regrading could justify this cost. As it happened, however, the very nature of the country helped to solve this problem

by providing an almost ideal topographical feature on which to develop or "make" the required extra 1.6 miles in length as compared with the original alignment.

As explained in the descriptive article, this feature was a conical knoll on a spur of sufficient diameter to accommodate the permissible curves, and with a neck connecting it to the rest of the spur. The ridge of the neck was at just the right level to support formation on a grade falling continuously from the summit of the bank at the equivalent of 1 in 75. Survey engineers are not often favoured with such a natural feature just where they want it. By locating a spiral round the knoll, in the course of which the line turned through about 560 deg., all the extra length was thus developed without any appreciable general deviation from the direct route. In spite of the high cost of the long rock cutting and two short tunnels through the neck, unavoidable on the lower part of the spiral, the regrading was therefore justified and the through "up" loads are now worked from Junee northwards without double-heading. This and other recent improvement works are greatly to the credit of the N.S.W.G.R. administration and to the efficiency of its engineering staff.

* * * *

Indian Railways in 1946-47

IN our October 22 issue, an editorial article appeared entitled "The Swan Song of British Indian Railways," which was based on volume 2 of the Indian Railway Board's administration report for the year ended March 31, 1947. Volume 1 of that report was received later, and deals with the first complete fiscal year after the end of the war. There was a marked decline in military traffic, both coaching and goods. On the other hand, civilian passenger traffic increased appreciably, though goods declined. The net result was that gross traffic receipts of Indian Government Railways fell from Rs.225.74 crores (£169,305,000) to Rs.203.35 crores (£152,512,500) as between 1945-46 and 1946-47. For all Indian railways the results were roughly similar, as may be seen from the table below, which, however, also includes figures relating to other notable years during the past decade. (One crore of rupees—Rs. 1 crore—is equal to £750,000).

	1938-39	1944-45	1945-46	1946-47
Gross earnings (Rs. crores) ...	107.15	232.90	243.59	222.04
Working expenses (Rs. crores) ...	71.18	148.81	169.05	179.02
Operating ratio (per cent.) ...	66.44	63.89	69.52	80.63
Number of passengers originating (millions) ...	530.62	926.70	1,044.34	1,138.95
Passengers earnings (Rs. crores) ...	30.73	76.53	86.74	89.54
Freight tons originating (millions) ...	88.36	102.13	100.63	91.49
Freight earnings (Rs. crores) ...	68.57	114.68	116.32	104.04
Total train-miles (millions) ...	197.04	179.89	190.15	198.14
Gross earnings per train-mile (Rs.) ...	5.40	13.11	12.96	11.35
Working expenses per train-mile (Rs.) ...	3.58	8.37	9.00	9.14
Net earnings per train-mile (Rs.) ...	1.82	4.74	3.96	2.21
Net earnings per mean mile worked (Rs.) ...	8,619	20,528	18,125	10,516

It will be noted that, whereas the number of passengers carried more than doubled between 1938-39 and 1946-47, the corresponding increase in freight tonnage was under 3½ per cent.

During the year under review the railways in India had to work under great difficulties, particularly on account of the severe strain in the war years on rolling stock and the lack of spare parts. Overworked locomotives due for replacement coupled with inferior coal were responsible for deterioration in punctuality. Civil disturbances in the autumn of 1946, and labour unrest, notably in the Calcutta docks, also adversely affected operation.

A brighter picture was, however, presented in the initiation of the first practical measure towards simplification of the rating structure on the railways generally. It took the form of telescopic class rates on a continuous mileage basis, introduced as an experimental measure on February 1, 1947.

No large-scale programme of improved amenities for the public was possible, due to lack of essential equipment—notably coaches, labour difficulties, and the pre-occupation of railways with immediate post-war problems. A number of passenger train services, however, were restored, and many detailed improvements were effected. Despite prolonged negotiation with the unions and the appointment of a pay commission and an adjudicator on service conditions, there was a general strike lasting a month on the South Indian

Railway. The total cost in respect of staff was Rs.67½ crores, an increase of nearly Rs.6 crores over 1945-46. Abnormal rainfall caused damage to eight of the Class 1 lines.

The Government proceeded with its policy of purchasing privately-owned railways. On October 1, 1946, the Sara-Serajganj and Ahmedabad-Prantey Railways became State lines, and on April 1, 1947, the Mandra-Bhaun line was acquired by the Government. During 1946-47, moreover, it was decided to purchase the Mymensingh-Bhairab Bazar (100 miles, metre gauge) and Khulna-Bajerhat (20 miles, 5 ft. 6 in. gauge) company-owned lines; both purchases were to take effect from April 1, 1948. The Railway Department also took over administrative control of Vizagapatam Port from the War Transport Department on April 1, 1946.

Several lines were under construction during the year. The only broad-gauge one was a branch from Rupar on the North Western Railway, to Talura, to serve the construction works on the Bhakra Dam in the Punjab; it is 34 miles in length. The other constructions were all metre gauge, namely, the Pipli-Gop section of the Jamnagar & Dwarka State Railway (23 miles), the Sanganer Town-Malpura Swai-Mangarh section of the Jaipur State Railway (76 miles), and the Mavli-Bada Sadri section of the Mewar State Railway (47 miles). In addition, the 76-mile broad-gauge Bhirsan-Khairada section of the Great Indian Peninsula Railway, which had been dismantled to provide material for overseas railways during the war, was in process of being restored. Actually, no new lines were opened to public traffic during the year.

The development of a widespread network of wireless communications on all Government lines had almost been completed by March, 1947. The use of that form of communication had been intensified, and had relieved the seriously overloaded land lines. Experimental both-way wireless communication between control offices and running trains proved feasible up to distances of 40 to 50 miles from the control; but it was decided not to perpetuate the system.

Output from the ten principal railway collieries rose from 3,583,783 tons in the previous year to 4,139,055 tons; and 24,190,484 tons out of the total output of 26,689,747 tons of coal mined in all collieries throughout British India were carried by rail.

The following rolling stock was placed in service and ordered during the year:

	Placed in service		Orders were placed for	
	broad-gauge	metre-gauge	broad-gauge	metre-gauge
Locomotives ...	167	351*	400	58
Coaching stock ...	157	47	971	385
Goods stock ...	14,589	100	4,050	Nil

* 351 "MAWD" engines purchased from Disposals Directorate

The Tata Engineering & Locomotive Co. Ltd., of India, was engaged during the year in the manufacture of 100 new boilers for the "S.G.S." class 0-6-0 type of broad-gauge locomotive.

The Research & Development Branch continued to carry out research into the causes of locomotive oscillation, and longitudinal weighbars were specially designed for the "W.L." class 4-6-2, incorporating the latest pattern of electric resistance gauges, so fitted that, when used in conjunction with the usual transverse weighbars, the magnitude and direction of the resultant horizontal forces between engine and track could be recorded. In this way it would be possible to predetermine values of lateral control necessary for new types of locomotive. Investigation was also carried out to select the most suitable design of grate for use with Indian non-coking coals. Dynamometer tests were conducted with a variety of hand- and mechanically-fired types of engine. In accordance with the standard design approved in 1939, 76 third class carriages were built during the year. Designs and specifications were prepared for a pilot order for 16 "W.P." class broad-gauge Pacific locomotives with 18-ton axle loads.

As British control of Indian railways terminated 4½ months after the end of the year under review, the report covers the last complete year of the century of British Indian railway administration. Even the most hostile critics of the British regime in India must admit that British personnel and capital, in building up a 40,000-mile railway network covering the whole of British India, were responsible more than any other single agency for opening up the country, developing its resources, and eliminating famine.

Gas Turbine Locomotives, Western Region

TO the Great Western Railway is due the credit for its courageous policy in initiating an experimental trial of gas turbine traction in Great Britain. The determination with which this difficult engineering problem was pursued is the more marked when one considers how many and how facile are the arguments why such an investigation should *not* be carried out. The results of these efforts are now appearing, and it is hoped that by June the Brown-Boveri unit will be undergoing trials on the Swiss Federal Railways. We publish descriptions and diagrams of this locomotive, and of the Metropolitan-Vickers design which is being constructed concurrently, elsewhere in this issue.

A comparison of these two designs, as representing two solutions of a given problem, is of great technical interest. The Metropolitan-Vickers design, as the British solution, has had the advantage of a considerable amount of intensely concentrated research, during the war, into matters related to gas turbine for aircraft, and, later, for marine propulsion. At an early stage, however, a major modification was made, as a result of which the bulky heat exchanger was eliminated. The Metropolitan-Vickers design enables about 35 per cent. of the total power developed to be available for traction, so that the balance (65 per cent.) is used for compressing the air, which is a high proportion indeed, the ratio of these two quantities being roughly 1/2, whereas earlier experience with gas turbines had usually yielded a proportion of about 1/3. The decision to adopt a higher ratio of compression than was at first contemplated has resulted in a comparatively compact power unit and has also raised the thermal efficiency to a level at which the original proposal to incorporate a heat exchanger could be dropped without regrets. There is an unusual system of suspension in which laminated springs are provided above and below the axles.

The Brown-Boveri unit is slightly smaller; its overall length is 3 ft. 8 in. less and the gas turbine output at full load allows some 2,500 h.p. to be transmitted to the generator; an exactly comparable figure for the Metropolitan-Vickers machine is lacking, but we are informed that at N.T.P. rating about 2,700 h.p. is available at the rails. An allowance for friction and transmission losses would give a somewhat higher figure for the power delivered to the generator.

A fundamental difference between the two locomotives, however, is that, unlike the 120-ton total-adhesion Metropolitan-Vickers machine, the Brown-Boveri design provides for a single carrying axle between a pair of driving axles on each bogie. The adhesive weight is only 77 tons out of a total of 115 tons in this case. By omitting the drive from the centre axles, a more compact bogie was secured, with a great reduction (about 3 ft.) in the rigid wheelbase as compared with the British locomotive. Helical springs are used for the outer (driving) axles in the bogies of the Swiss machine and laminated springs for the centre (carrying) axles. For all these differences the two designs have sufficient in common to confer considerable value on results achieved under comparable conditions.

Fuel oil is barely mentioned in the present description; and engineers will naturally wish to know the calorific value and physical properties of the fuel on which the design data were based. They will be even more anxious to know whether its availability can be relied on in Great Britain in the future. Uncertainty of this kind has had its influence on recent attempts to use oil fuel in steam locomotives. The claim is made that the oil-fired gas turbine-electric locomotive has an efficiency (on a basis of equal work done) twice as great as its steam rival. The effect of this on the railways coal bill will, however, be negligible unless gas turbine locomotives are put into operation in large numbers.

Without doubt, due credit should be given to Mr. F. W. Haworth, Chief Mechanical Engineer, Western Region, and his staff, and to their collaborators in the works concerned with the present experiment, which must have an important influence on any considerations of the extent to which this type of motive power is to be adopted in the future. So far as Great Britain is concerned, however, will the pulverised-fuel gas turbine ultimately prove to be the chief alternative to steam traction, with advantages transcending anything that either the diesel engine or the oil-fired gas turbine can offer?

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Class Distinction

27, Linden Street,
Romford, Essex. January 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I wonder why the third class passenger by Pullman trains from Kings Cross Station is bound to travel in stock pointedly designated *Third Class Car No. 70* or *Car No. 105 Third Class*, to give two examples. The more fortunate first class ticket holder can be carried buoyantly northwards by *Belinda* or *Lucille*.

If class distinction is really necessary, there is this selection of names to give pride to the third class traveller:—

Eastbury	Northbury
Eastwood	Northwood
Eastfield	Northfield
Eastford	Northford
Eastway	Northway, etc., etc.

Yours faithfully,
C. E. MASTERSON

Railway Fares and Services

Merop, Trevone Bay,
Padstow, Cornwall. December 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your brief comment under the letter from Mr. Parkes in your December 17 issue is most timely, and gave me, for one, great pleasure.

Some of us with practical experience of railway working may not like nationalisation, but let us be fair and give the Railway Executive a chance.

Every time I read letters of the kind which have appeared so often during the past year, I wonder to myself what practical knowledge of the complexities of railway organisation the writers possess. Sometimes the answer is obvious.

The Executive has an immense task. Let us make our comments and suggestions and leave it to examine the pros and cons, safe in the assumption that anything worth while will be brought to its notice.

Yours faithfully,
C. R. CLINKER

Railways and Steel Shortage

Eynesbury,
St. Neots. January 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The railways complain that they cannot provide more coaches and wagons because of cuts in steel supplies. But they have plenty of steel of their own in their million outworn 10-ton wagons. They actually possess thousands of 20-tonners with a tare weight of around 8½ tons, compared with nearly 13 tons of two 10-ton wagons. Consequently, if 1,000 of the former were built to replace 2,000 of the present outworn wagons, they would be left with a surplus of 4,000 tons of steel to build coaches.

Heavy savings would also be made in rails (and sleepers), as a 20-ton wagon occupies hardly more than half the siding space of two 10-ton trucks.

The Americans are actually building 50-ton wagons with a tare weight of only 15 tons, and your Christmas number records that the French are securing an economy of 50 per cent. in tare weight in building 65-ton coal wagons.

The Railway Executive should make an effort to get rid of its middle-of-last-century mentality.

Yours faithfully,
E. R. B. ROBERTS

Eastern Region Salary Ceilings

London. January 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The thanks of many are due for your references in "State Transport's First Year" in your December 31, 1948, issue to salary ceilings and cheeseparing policy. Eastern Region officers have no first-hand knowledge of ceilings under nationalisation as maxima have not been notified, but we have bitter memory of cheeseparing under private enterprise.

We have hoped in vain that Executive policy generally towards standardisation would have embraced salaries, but the wide disparities that existed between the L.N.E.R. and other companies continue now that we are organised Regionally. There may be some justification for such differentials as between H.Q. officers of the London Midland Region and the Eastern Region, but surely not as between the Western and Eastern Regions. In either case it would be difficult to justify differences at district level.

Broadly speaking, at the Railway Executive and in other Regions appointments are made at approximately 80 per cent. of maximum salary, but in the Eastern Region the L.N.E.R. policy of cheap labour still persists at about 66 per cent. or less. No wonder you discern signs of frustration and lack of zest. Who is responsible for this isolated Regional policy of cheeseparing?

One may concede that by nationalised standards some posts are overvalued—a concession that will prejudice nobody on the Eastern Region—but after twelve months it is not unreasonable to expect that some unified basis would have been evolved—and applied where necessary. If the Eastern Region salaries are ever upgraded it is most improbable there will be retrospective effect, and the matter is even graver as the present "depressed" salaries not only prejudice an officer during his career, but carry forward in effect to his pension.

Perhaps, Sir, instead of complaining, we should be grateful that in the railways present financial stringency we are enabled to make a not inconsiderable grant in aid, but such altruism owes nothing to purity or pleasure.

Yours faithfully,
DISCOURAGED

Railway Benevolent Institution

23, Gordon Square,
London, W.C.1. December 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The present is an appropriate season to express on behalf of the Board of Management of this Institution its most sincere thanks for the valuable assistance you have been pleased to render during 1948 in giving publicity to the work of the Institution, and it is hoped that we may look forward to a continuance of your favours during 1949.

Changed conditions make it more than ever necessary for the staff to recognise that the ability of the Board to assist in times of adversity depends so much on its goodwill, support, and co-operation.

Yours faithfully,
H. C. WALTON
General Secretary

Pyrotechnic Equipment for Train Protection

130, Southport Road,
Liverpool, 20. December 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—On the British railways, "the matter is under consideration"—and has been since the Dinwoodie accident in 1928!

A very effective type of pyrotechnic equipment is in daily use in the U.S.A. and Canada. The flares are of such brilliance that they may be used in daylight as well as in the dark. It is the duty of the trainman to set the flare in the track should the train be held up for unusual reasons or beyond a certain length of time. Efficient and effective.

It would appear, therefore, that our railway officials have been wasting their time for years—presumably because they hate to adopt the successful ideas of others. It cannot be due to ignorance, because we send "missions" to America from time to time to find out what methods are in use there.

Yours faithfully,
G. RICHARD PARKES

Free Transport

8, Station Road,
Enfield, Middlesex. January 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It seems to me that the question of the charges to be made by the various Executives of the British Transport Commission is being approached with too much of the outlook which has prevailed under the old system of private ownership.

To maintain anything like the present population of this country, it must be admitted that cheap and efficient transport is essential, and that the welfare of the whole population is dependent on such transport. It must follow, therefore, that the whole population should be prepared to foot the bill of the cost of providing transport. From this it follows that the cost of keeping the transport services going should not be confined to the direct users of transport.

This brings us to the logical conclusion that for passengers and freight to flow to the most suitable service, all public transport should be entirely free of cost to the transport user.

If transport were free, there would be enormous savings in clerical and accountancy and administrative staffs, ticket printing, advertising, etc. These savings should more than offset the undoubted increase which would take place in operating staffs such as drivers, conductors, goods handling staffs, etc. There would also be a considerable saving of petrol because there would no longer be such inducement as there now is to own private motorcars, nor to patronise long-distance coaches.

I have no doubt you and your readers will be able to find many flaws in my argument, but so far as I can see, taking things by and large, and after the initial stages of novelty and teething troubles, it would be an excellent thing for the welfare of the country if transport were free for all.

Yours faithfully,

R. C. PATTERSON

[If free transport, why not free gas, free electricity, free water, and all other public services? The logical conclusion of the argument Mr. Patterson initiates is the provision, free, of all services and amenities. In the first stages of the development, the provision of the services would be paid for out of taxation. In its final development there would be no object in providing a monetary unit, as everything that could be bought would be provided free. The final absurdity would be reached when (a) money was abolished because it could buy nothing, (b) no money was available to provide the free goods and services, and (c) human nature had not reached a sufficiently high state of development to guarantee maximum productivity by the individual without personal reward, but for the overall good of the community.—ED., R.G.]

Cambridge Buffet Expresses

Cardinham House,
Bodmin. December 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is interesting to note that the timing of the buffet expresses between Kings Cross and Cambridge, as reintroduced, is not so good as in 1939. The L.N.E.R. handbill of the pre-war service advertised: "Buffet car trains in each direction: To Cambridge 1 hr. 15 min. To Kings Cross 1 hr. 12 min." as shown in the handbill reproduced in part. There were five trains each way mostly so timed.

TO CAMBRIDGE		TO KING'S CROSS	
To LIVERPOOL ST. 1 hr. 5 mins.		1 hr. 15 mins.	
King's Cross ... dep.	9.35	12.15	12.40
Liverpool Street ...	11.10	12.40	1.10
Welwyn Garden City ...	10.16	12.44	1.42
Hitchin ...	10.16	12.56	1.21
Letchworth ...	10.22	1.21	2.27
Royston ...	1.16	3.13	3.11
Cambridge ... arr.	10.50	12.15	1.32
Cambridge ... dep.	8.5	9.25	10.11
Royston ...	9.41	10.11	11.12
Letchworth ...	9.58	10.28	11.29
Hitchin ...	10.2	10.5	11.5
Welwyn Garden City ...	10.15	11.19	12.35
Liverpool Street ...	9.47	9.51	11.19
King's Cross ...	10.39	11.42	12.42

SO—Saturdays only.

SX—Saturdays excepted.

LIGHT REFRESHMENTS OBTAINABLE AT THE BUFFET ON TRAIN

In the reinstated service of December 6, as announced in your issue of November 26, most of the trains take 15 min. longer, and only one train, on three days in the week, comes within 10 min. of the 1939 schedule. It will be seen that the handbill also advertised the smart Cambridge-Liverpool Street timing of 1 hr. 5 min., up and down, of 1939. Will any such train be reinstated?

Yours faithfully,

REGINALD B. FELLOWS

The Winsford Accident

The Old Manor,
Salisbury, Wilts. December 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. Skelton's letter on page 715 of your issue of December 24 brings up a very old question.

I heard of a case in 1916 when a train ran slowly on to the next station after the communication cord had been used. I have the impression (but would not be certain) that when communication cords were first introduced there was much argument as to what the effect would be, and that it was finally decided that the train was to be brought to a rest, to avoid any possibility of a driver deliberately ignoring it. This was, of course, in the pre-corridor days.

With corridor stock there is a chance of getting assistance from other compartments in cases of emergency, but when each compartment is sealed off, the next station may be too late in cases of sudden illness or violence. There is much to be said on both sides; one is inclined to immediate investigation.

Even trains standing in sight of a box have been forgotten before now. One has heard of a freight train parting in a single-line section. The driver went on with the front part

blissfully unaware of anything amiss. By some extraordinary coincidence nobody at the next station noticed that the train was not complete, with the result that a second train followed immediately. Luckily the guard of the first train realised that he had been left, and brought the rear part to rest, on a falling gradient (practically the whole section was), and got fog-signals down in time to "shoot" the second train before it hit him.

There are several causes, voluntary and otherwise, of trains stopping in a section; these would not be covered by a berth track-circuit. Full track-circuiting would do it, but unless block working is properly carried out it becomes not only useless, but dangerous.

Yours faithfully,

COURTENAY BARRY

Sunday Trains from Bradford

King's Mead,
Seaford, Sussex. December 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I append details of what must be a vintage bit of travel in this year 1948 (a "century of progress"!)

Sunday, December 26, Bradford dep. 11.0 a.m., Leeds dep. 12.10 p.m., Derby dep. 3.35 p.m., St. Pancras arr. 8.50 p.m.

I leave a less weary head than mine to work out times and miles per hour. Need I add there was no restaurant car?

Yours truly,

JOHN W. RATTRAY

"A Railway Engineering Career"

Eastleigh, Hants.
December 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I note that in your editorial under the above heading in your December 24 issue, you make the assumption that Sir Eustace Missenden "obviously intended to include" engineers.

In view of past experience this is dangerous, and in the absence of specific mention of particular grades or categories it is safer to assume that they are not included.

The professional and technical staff, for instance, is still without the weekly increase of 7s. 6d. granted some time ago to most other grades, and that this is indicative of the esteem in which the engineering staff is held, as may be confirmed by comparing its salaries and responsibilities with similar posts in industry.

The general pandering to organised labour is lamentable when it produces situations in which a young man, by improving himself and entering the drawing office, loses about 30s. a week.

The R.C.A., being predominately clerical, does not provide adequate representation for professional and technical staff, and the Railway Executive obviously appreciates this and acts accordingly.

OLD ASHFORDIAN

Suggestions and Innovations

2, Kensington Palace Gardens,
London, W.8. January 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In a footnote to a letter published in your issue of December 17, you tell your correspondent that he "expects too much too quickly." How right you are!

In 1898 the *Daily Mail* published a letter in which I suggested the construction of "six-a-side" bogie stock in order to ease overcrowding on suburban trains. Nearly 50 years later the Southern Railway proudly announced the production of such stock.

The same correspondent infers that suggestions and new ideas are not welcomed or acted on. Up to a point this is true. For instance, personal prejudice in the past undoubtedly prevented the universal adoption of automatic-couplers for passenger stock and continuous brakes for freight trains, and delayed the introduction of third class sleeping cars.

In years gone by, many locomotive engineers were definitely opposed to trying out new ideas. Their attitude was not unlike that of a famous Commander-in-Chief who, when dealing with the proposed adoption of breech-loading guns, muttered:—"I regard the breech-loading gun as an innovation and all innovations as detrimental to the Service."

Incidentally this seems to be the official attitude to the rotary snowplough. Of course, the shovel is a simple instrument, but what about the wage bill? Time apparently does not matter in the Highlands.

Yours faithfully,

P. M. BROOKE-HITCHING

The Scrap Heap

NINE THOUSAND YEARS OF SERVICE

Two hundred gold watches have been presented to Dunlop employees with a total of more than 9,000 years of service. Mr. W. W. Foster, General Works Manager, made the presentations on December 30 at a New Year party. The average service of the recipients was 45 years.

100 YEARS AGO

From THE RAILWAY TIMES, Jan. 13, 1849

We regret to have to call the attention of the secretaries of railway Companies generally to the imperfect manner in which the traffic-returns are supplied to us. Week after week we have to leave blank those columns to which the shareholder naturally looks with anxiety for the basis of his hopes and expectations. While upon this subject we recommend to general imitation the details supplied to us weekly of the traffic upon the Eastern Counties lines. It may be objected that the elements of the traffic are too minutely set forth; but there can be no doubt but that such returns afford much valuable matter for the railway statistician.

WHAT IS AN ENGINEER?

"An engineer is a person who passes as an exacting expert on the basis of being able to turn out with prolific fortitude infinite strings of incomprehensible formulæ calculated with micromatic precision from vague assumptions which are based on debatable figures taken from inconclusive experiments carried out with instruments of problematical accuracy by persons of doubtful reliability and questionable mentality for the avowed purpose of annoying and confounding a hopeless chimerical group of fanatics referred to all too frequently as engineers."—From the "Vulcan Magazine."

A GOLDEN AGE

... At the present moment, the capital invested in railways in this country amounts to little less than a hundred and twenty millions. In return for this vast outlay we have advantages not to be estimated by pecuniary values. We can traverse the kingdom from one end to the other in a day; we can transact business in an unlimited market; we can visit all that is worthy of observation at a low cost both of money and time, and can renew as often as we please the pleasures of social intercourse with absent friends. London, as the grand centre of railway

communication, is, so to speak, in contact with the uttermost limits of the land. From Euston Square we can reach the Birmingham Terminus in three or four hours, or any city or town of note, with corresponding celerity, as far as Aberdeen in the north of Scotland. From Kings Cross we may fly to York, and thence again to the northernmost limits of the island. By the Great Western, at Paddington, we are borne to Bristol, and down through Devonshire and Cornwall to the verge of the Land's End. From the Waterloo Station we are shot down to the Southampton Docks, and breakfasting in the Strand may dine in the British Channel. From Shore-ditch we are whirled through the eastern counties to the shores of the German Ocean; and from the London Bridge Station we may reach the south coast in two or three hours, or be wafted into the heart of Paris in time for dinner. . . .—From "Old England," published by James Sangster & Co., about 1855.

THOSE WAITING ROOMS

British Railways, we are informed, are striving to provide a better service in their refreshment rooms, and here and there one can detect an improvement. Would it, I wonder, be considered reasonable, while an east wind is driving the falling snow along slushy streets, to suggest that the authorities also give a thought to the waiting rooms and their shivering denizens.

The thought is prompted by a personal experience. A few days ago I arrived at a suburban station at 3.10 a.m. and discovered that I had to wait an hour and twenty minutes for a connection. There were three platforms, there was no light in two of the waiting rooms, and there was, of course, no fire in any of them. On the third platform I found a faint light in one waiting room—the ladies'—and there I sat and shivered, partly with cold and partly with apprehension, for I am no lady.

After all, in the bad old days a fire in a waiting room was thought necessary. We even dared to grumble if it was not a good one. The empty grates still bear chill witness to out-of-date ideals and the march of progress. Is there not yet enough fuel—ovoids, briquettes, "Coalite," or even open-cast—to make even a token blaze in these yawning grates? Or has austerity itself become an ideal?—"Northern II" in "The Yorkshire Post."

Tailpiece

THE BUSTOCRATS

When you queue in hope by the King's highway,
Especially if it's a rainy day,
You are apt to regard with a jaundiced eye
The bustocrats sailing swiftly by.

For, strange to relate, when the need's
most great
The bustocrats say that you've got to wait,
Maybe for hours, if you have a yen
To board a bus between two and ten.

The latest whim of bustocracy
Is to say to people like you and me:
"If to shops or shows you should wish
to fare
In the week-end break, try Shanks's
mare!"

So, if you fear that you may be caught
And bustocrats bring your plans to naught,
You'll find that your efforts won't be in
vain
If you make a date with a good old train.

A. B.



"Twenty-three point five degrees centigrade, please"

[Reproduced by permission of the proprietors of "Punch"]

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Reorganisation Plans Maturing

Figures quoted by Sir Arthur Griffin, General Manager, indicate that the general reorganisation and planning for future development are maturing. During the period January to July, 1948, compared with 1947, there was an increase in wagon-carrying capacity (in tons) of 7 per cent. In the same period there were the following operational increases, given as percentages:—

Total tonnage increased ...	17.2
General goods increased ...	21.2
Coal and coke increased ...	13.2
Chrome ore increased ...	85.3
Copper increased ...	11.0
Net ton-miles increased ...	16.3
Train-miles increased ...	9.7
Wagon-miles per wagon day increased ...	6.2
Net ton-miles per wagon day increased ...	8.1

SOUTH AFRICA

Results

For the period April to September, 1948, there was an accumulated deficit of £1,361,096. In September itself expenditure, excluding net revenue appropriations, amounted to £7,668,398. The month was closed with a total deficit of £427,531. Total revenue amounted to £7,281,963, and the net revenue appropriation to £41,096. Harbours showed a surplus of £203,122 for the month, and most of the other subsidiary services a deficit, which, in the case of the railways, amounted to £513,791, with the overall deficit the figure mentioned above.

The railways have increased their charges by only 17½ per cent. in the last ten years although the rise in commodity prices now ranges from 60 to more than 200 per cent. Increases in railway operating costs can no longer be met by increasing the traffic volume. With their present equipment the railways have reached almost the limit of their earning capacity on the present basis of rates and fares. The expansion of traffic volume is being offset by the continued rise in operating costs which includes such items as £17,000,000 a year for cost of living allowances, and nearly £6,000,000 a year for overtime payments.

In 1932-33, the operating ratio for the railways was 75.61, in 1935-36 it was 64.57, in 1945-46 71.8, and in 1946-47 72.76 per cent.

WESTERN AUSTRALIA

Houses for Railway Staff

The restriction of building during the war has created a State-wide shortage of housing accommodation which the Government, through the Western Australian Housing Commission, is making strenuous efforts to alleviate.

In common with others, railwaymen on transfer find extreme difficulty in obtaining housing accommodation. The Railway Department, therefore, has in hand a vigorous programme of housing construction. At June 30, 1948, 44 new houses had been erected during the preceding twelve months or were in process of construction.

Two main types of house have been decided on, the "Improved Mill Type," intended for the larger centres, and a somewhat less pretentious type, termed the "Banksiadale," intended to house permanent way men at outlying places.

The "Improved Mill Type" house is of weatherboard construction, has five rooms and tile roof, and is of pleasing design. The "Banksiadale" house is of four rooms with outer walls of Fibrolite above a rusticated weatherboard dado and roof of corrugated Fibrolite.

In an endeavour to accelerate the provision of these houses, a well-equipped woodworking shop is being established at West Midland, adjacent to the main Midland Junction Workshops, for the production of joinery and to carry out such pre-fabrication as is possible. Cabins and similar structures will also be manufactured there.

Further living accommodation has been provided by the removal and re-erection of unused barracks, conversion of army buildings acquired from the Commonwealth Disposals Commission, and the purchase of surplus school quarters. More building programmes are envisaged, and in view of the pressing need, every effort is being directed towards the maximum output possible consistent with the availability of manpower and materials.

UNITED STATES

Yard Improvements at Kansas City

The Chicago, Rock Island & Pacific is laying out a retarder yard at Armourdale, Kansas City, at an estimated cost of \$2,000,000. Forty roads, capable of dealing with some 4,500 incoming and outgoing wagons daily, are being installed, requiring removal of 100,000 cu. yd. of earth.

An intricate communication system will include telegraph, teletype, radio, and more than three miles of underground pneumatic tubes. Points and retarders will be worked from three 40-ft. control towers, and five 100-ft. floodlight towers will be erected to allow all-night operations. An icing dock where 84 vans can be serviced at one time is being reconstructed for more efficient handling of vans containing perishables.

CANADA

Pacific Great Eastern Railway

Further to the report in our November 19, 1948, issue it has been stated that any northward extension of the railway would have to be financed by the Government of British Columbia, as the C.P.R. and C.N.R. are not interested in participation. The proposed extension into the Peace River country would cost about \$50,000. The route has been surveyed and the existence of large coal deposits and agricultural wealth have been regarded as sufficient to encourage extension, but there seems little prospect of an early start. Meanwhile a highway between Vancouver and Squamish, the southern terminus of the line, is being considered.

Taxation of Branch Lines

The Saskatchewan Attorney-General's Department contended recently that the Canadian Pacific Railway branch lines in the province are liable to municipal taxation although its main lines are not. In the opening session of a two-day hearing before the court of appeal, Government Counsel said that an agreement signed in 1880 with the Dominion Government made impossible taxation of main lines and main-line property.

The case was brought by the Saskatchewan Executive Council and the Attorney-

General's office. Municipalities are trying to tax both main lines and branch lines of the company under five amended acts passed since 1944.

Government Counsel also contended that business as well as property tax might be levied on the 1,603 miles of Saskatchewan branch lines, but not on the 416 miles of main line. Five amended Saskatchewan statutes, the Village Act, the Town Act, the Municipality Act, the City Act, and the Local Improvements Act, allow taxation of railway property.

Removal of Quebec Central Station

The paragraph in our December 31, 1948, issue under the heading of "Future of Ottawa Central Station," relates in fact to the Palais Station at Quebec City, which the Canadian Pacific and Canadian National Railways have agreed, with municipal co-operation, to remove to a new site.

New Branch in Northern Quebec

The Canadian National Railways have completed a branch extending 50 miles north in the Bell River Valley into the hinterland of northern Quebec. The line was built primarily to open up a new section of the clay belt for agricultural settlement, and tap the great forest wealth of the valley. The farm land which it will make immediately available for settlement will accommodate a population of 15,000. The cost of this line was \$3,200,000, and the estimate of the capital wealth created by it is some \$40,000,000, according to railway sources.

ARGENTINA

Abolition of Return Fares

On January 1, return fares were abolished, except on suburban sections.

Acquisition of Diesel Equipment

A recent decree of the Argentine Government lays down that the I.A.P.I. (Trade Promotion Institute) shall place the sum of 70,000,000 pesos at the disposal of the Transport Secretariat to finance the purchase of diesel locomotives and equipment under construction in the United States.

Fines for Excess Luggage in Coaches

To do away with the obstruction caused by passengers' luggage taken into day coaches, and ensure that the excess luggage charges are duly paid, the Transport Secretariat has issued a resolution that passengers who take into the coaches luggage in excess of the allowance (30 kg.) must pay a fine of 20 pesos (with the alternative of two days' arrest) plus double the amount of the unpaid charges. Those using tickets belonging to other passengers to avoid paying charges for excess luggage will be fined 30 pesos (alternative, three days' arrest) plus three times the amount of the unpaid charges.

FRENCH INDO-CHINA

Railways in Tong-King Province

Because of the confused political and military situation in Tong-King province, the northernmost region of French Indo-China, only two railways are at present working. Passenger and goods trains operate only between Haiphong, the chief port, and Hanoi, the capital (62 miles) and between Hanoi and Vanden (6 miles), part of the 1,074-mile main line between Hanoi and Saigon. All other lines in Tong-King are closed, either because of having been wrecked by military opera-

tions, insecurity in the zones traversed, or the lack of locomotives and rolling stock through war action.

In November, 1948, 19,170 passengers were conveyed between Hanoi and Haiphong, and 3,710 between Hanoi and Vandien; goods traffic totalled 12,600 tonnes (of which 10,600 tonnes related to the Hanoi-Haiphong line).

The Chemins de Fer de l'Indochine et du Yunnan (which includes the Haiphong-Hanoi link) connecting Hanoi with Yunnan-fu in southern China, has regained full autonomy as from January 1, 1949, by agreement between the Indo-Chinese Government and the company.

The working accounts of the company for 1947 closed with a net profit of fr. 9,453,724, which enabled a dividend of 20 fr. per share to be paid. The company's line is 537 miles long, of which the section in Tong-King accounts for 248 miles (inclusive of the Haiphong-Hanoi section) and the Chinese section between Lao-Kay, the frontier station, and Yunnan-fu 289 miles. This line, like the other railways in Tong-King, is metre gauge. An article on the railways of Indo-China, with map, was published in our issue of August 28, 1942.

Publications Received

Géographie des Chemins de Fer Français. Vol. 1, Part 2. Réseaux Divers. (Geography of the French Railways, Vol. 1, Part 2. Miscellaneous Systems). By H. Lartilleux. Paris: Librairie Chaix. 20, Rue Bergère, 20e. 11½ in. x 8 in. 253 pp. Fully illustrated.—At a time when the closing of minor branch lines is being discussed in Great Britain it is interesting to read of the plans for the development of secondary railways in France outlined in the introductory chapter of this book. Although some small systems have succumbed to the effects of road competition, war damage, or changes in economic conditions, the Monnet Plan in France envisages retaining and bringing up to date 3,728 miles of line belonging to administrations other than that of the French National Railways Company. A further 1,553 miles would remain in operation with their existing equipment, leaving a similar mileage to be closed down as the revival of the road transport industry makes it practicable.

Secondary railways are the subject of the first chapter of the book, which is the second part of Volume 1 in the Geography of World Transport planned for publication by the Librairie Chaix. Part 1 was concerned with the system of the S.N.C.F. The scheme of the new part is similar, presenting a brief account of every system, admirably elucidated with maps, and supported by numerous whole-page plates. The second chapter, which deals with urban and inter-urban lines (including tramways) is of particular interest to students of transport by reason of the section dealing with the development and present state of the Paris Metropolitan system. Operating methods are described in some detail, and the layout of important interchange stations is shown diagrammatically. The survey includes the Sceaux suburban line, which was electrified and taken over by the Metro in 1938, and is worked at 1,500 volts d.c. with overhead conductor.

Funiculars, rack railways, and telfer lines are the subject of the third chapter. These are found not only in mountainous regions, but also in certain cities, such as the Sacré-Cœur funicular, worked by the

ITALY

Development of Door-to-Door Services

To develop door-to-door services and prevent loss of more traffic to the roads the State Railways are considering a scheme for the greater use of road vehicles for the conveyance of empty wagons to consignors' premises to be loaded there, and of loaded wagons direct to consignees' premises for unloading.

SWITZERLAND

Chair Lifts and Ropeways

According to a decision taken at a recent conference of the Swiss Federal Railways, chair lifts or chair ropeways operated by Swiss private railways and other undertakings of which there is a number in Switzerland, are now considered a regular means of transport.

Chair lifts have developed from the war-time mountain lifts or primitive ropeways set up by the military to assure the regular supply of munitions to lonely defence stations in remote parts of the Alps. In many cases, the first post-war chair lifts intended for private traffic were built with surplus military materials, but gradually

they developed into more comfortable and safer ropeways mainly for the use of skiers and others indulging in mountain sports. They may be classed as minor ropeways using chairs (single-seater or double-seater) instead of cabins. They are well patronised by tourists and excursionists, and now operate to fixed schedules. There are limited facilities for the conveyance of goods; hence their official recognition as a further link in the transport system. For the first time, the official Swiss railway timetable (covering also postal services, lake services, and air services) contains the schedules of thirteen chair lifts.

Swiss Restaurant Car Company

On January 1, the headquarters of the Swiss Restaurant Car Company, formerly at Berne, were transferred to Olten, the railway centre at the junction of the Zurich-Berne, Basle-Gothard, and Olten-Neuchâtel-Lausanne main lines. Olten is the busiest railway centre in Switzerland with 392 trains a day leaving or arriving, or one train every 3½ min. The Swiss Restaurant Car Company is responsible for the catering services on 36 dining cars and five buffet cars, all owned by the Federal Railways.

Metro, in Paris, and the funiculars and rack railway of Lyons. Finally, there is a chapter on the trolleybus and its future, although this method of transport is also reviewed in the section on urban and inter-urban systems under the headings of the various centres where it exists. Far from being viewed as an impermanent transition vehicle between the tramcar and the motorbus, it is expected to have a promising future in its own right, increasing in size and being used already by some administrations for goods as well as passenger transport. Four trolleybus routes that have replaced minor railways, or have been introduced to provide for tourist traffic of recent growth, are described.

In the many illustrations of trains on minor railways there is little hint of the archaic atmosphere eagerly seized on by humorous artists and writers in this country when depicting the real or fancied vagaries of country lines. Railcars and electric trains of modern appearance abound. Even some of the inter-urban routes boast equipment recalling a full-size railway rather than a glorified tramway. A view of an electric motor coach hauling seven trailers on the Lyon-Neuville line (10 miles) suggests that it is by no means in a spirit of irony that the Lyonnais refer to this transport facility as "Le Train Bleu."

Rubber Developments.—A growing number of materials is becoming available to railway rolling stock manufacturers for upholstery of coaches. Attention is drawn in an article in the third number of the British Rubber Development Board's journal to the qualities of latex foam for this purpose. In a market research survey conducted in the U.S.A. at the instigation of the board, widespread recognition among industrialists of the merits of latex foam was found, but it was concluded that to increase its use substantially the price would have to be reduced and the public made aware of the comfort obtainable from it. With these provisos it is considered that, after tyres, the greatest single potential outlet for natural rubber is in the form of latex foam for upholstery. Two other items of interest in this number of *Rubber Developments* are an article on rubber suspension sys-

tems for vehicles, by A. E. Moulton, of Geo. Spencer, Moulton & Co. Ltd., and a note on the London Transport de-icing equipment, incorporating rubber rollers, which transfer the anti-freeze fluid to the carriage collector shoes, which, in turn, spread it along the conductor rail.

Billets, Bars, and Slabs for Automobile and General Engineering Purposes.

Features of alloy steel products made by Hadfields Limited, of Sheffield, to British Standard Specification 970 are set forth in this brochure. B.S.S. 970, besides specifying content, takes account of the intended purpose and the desired mechanical properties in relation to mass at the heat-treatment stage of alloy steel products. Specification tables for billets, bars, slabs and rough rolled rounds in case-hardening, alloy and carbon steels, conforming with this standard, cover twelve pages of the brochure. A 28-in. rolling mill and a 10-ton electric arc furnace at Hadfields Limited are illustrated and mention is made of the service given by the Hadfield Research Organisation, which carries on the work which was begun by Sir Robert Hadfield.

Harbilt Electric Trucks.—Among the advantages claimed for this pedestrian controlled truck, in a catalogue issued by the makers, the Harborough Construction Co. Ltd., Market Harborough, are that the speed of the truck is determined by the speed at which the conductor walks, thus eliminating the possibility of breakdown due to excessive speed, and that with a weight ready for use of 8 cwt. and a payload of one ton, the useful load of the truck is more than twice its own weight. The truck, various models of which are available for use in factories, warehouses, railway stations, etc., has a range up to 12 miles and a speed forward or reverse of 3½ m.p.h. The standard model has a turning circle of 21 ft. The motor is of a specially designed 2-h.p. traction type, and transmission is double-reduction through worm and helical gears. In the catalogue, there is an illustration of a standard model, which will negotiate a gradient of 1 in 5 under full load, towing luggage up a ramp at a London railway station.

Experimental Gas Turbine Locomotives, Western Region

Progress in the construction of two gas turbine-electric locomotives ordered by the former G.W.R. two years ago from the Metropolitan-Vickers Electrical Co. Ltd. and British Brown-Boveri Limited has now reached an advanced stage

A GOOD deal of interest was aroused in 1946 when the former Great Western Railway decided to give serious attention to gas turbine traction. Orders were placed with the Metropolitan-Vickers Electrical Co. Ltd. and British Brown-Boveri Limited for two experimental locomotives, and each was to have a continuous rating of 2,500 h.p. and a maximum speed of 90 m.p.h. Overall dimensions and total weight were to be approximately the same.

Metropolitan-Vickers Locomotive

In the initial description of the Metropolitan-Vickers unit, given in our January 24, 1947, issue, it was pointed out that the construction programme was based on a power plant involving a minimum of new design. It was, in fact, similar to the marine propulsion gas turbines supplied to the Admiralty, which, in turn, were based on the F2 aircraft jet propulsion units. The application of such a plant to a locomotive would have involved some sacrifice in thermal efficiency if used without waste heat recovery, and, therefore, a heat exchanger formed part of the power equipment.

When the project began to develop it became evident that, for reasons unconnected with the power plant, the original construction programme could not be realised, and that the amended programme offered the possibility of incorporating in the unit the new gas turbine which the company already had projected as a standard power plant for high-performance locomotives. With the approval of Mr. F. W. Hawsworth, Chief Mechanical Engineer, Western Region, detail design of this new power plant was put in hand, and this is the unit which is now being built at the Manchester works of the Metropolitan-Vickers Electrical Co. Ltd.

This new plant has several important advantages over the original scheme, but the fundamental one is that the combined thermal efficiency of its turbine and compressor units has been raised to the point of yielding the same overall efficiency, without a heat exchanger, as the earlier design could offer with such a device. That somewhat heavy adjunct has, therefore, been dispensed with, giving a considerable reduction in the weight and bulk of the plant.

The increase in thermal efficiency is due mainly to two factors; first, because the plant has been designed expressly for railway traction it will operate under the most favourable conditions; and, second, advantage has been taken of recent axial-flow compressor developments to use a considerably higher compression ratio than that of the superseded plant.

The reduction in weight of the prime mover has permitted the installation of a unit of increased power, together with transmission equipment of higher continuously rated tractive effort, without increasing the locomotive weight, despite the substitution of cast iron and steel for the aluminium alloy used in the compressor of the original plant. Further, this reduction in bulk has improved the layout of equipment in the locomotive body, and has made through passage possible be-

tween the driving cabs, with ready access to the components at all times. These points are made clear in the drawing on page 40.

Another important change from the earlier design is the adoption of the single-shaft arrangement in which there is one turbine unit only. This is direct-coupled to the compressor unit and drives both that machine and the external load. This arrangement is desirable in a power plant for locomotive applications, so that dynamic braking can readily be provided, where conditions demands, through the traction motor and generators and the compressor unit.

In this particular instance the length and severity of gradients are not sufficient to require this form of braking. The control equipment embodies features necessary for automatic acceleration of a machine with turbine and compressor mechanically coupled when increased output is demanded.

The three main components of the thermal plant are an axial-flow compressor, a combustion chamber of the flame-tube type, and an axial-flow turbine in which air as the working fluid is subjected to the cycle of compression, heating, and expansion. As with any other form of internal combustion engine the compression of the working fluid demands much more of the work done by the expanding fluid than is available as output; in this case, the output is 35 per cent. of the power produced by the turbine, the compressor absorbing the other 65 per cent.

Turbine and Compressor Stages

The compressor has 15 stages and comprises a cast-iron stator and a forged-steel rotor and stainless-steel blading. The turbine has five stages, and is built up from a cast austenitic steel stator and a forged austenitic steel rotor, with blading of nickel alloy and austenitic and ferritic steels. Each of these rotors runs in two plain bearings, and their adjacent shaft ends are direct-coupled through a semi-flexible steel coupling. The full-load rotor speed is 7,000 r.p.m.

The combustion chamber is mounted between the compressor outlet and turbine inlet, being supported from the stators of these machines, and it consists of six cylindrical flame-tubes symmetrically disposed around the coupling of the motors with axes parallel to the machine axis. The flame tubes are constructed entirely of steel, mainly of the austenitic heat-resisting type, and are provided with quickly detachable joints for ease of maintenance. The chief consideration in choosing the flame-tube design rather than the annular type was that of access to the coupling and inboard bearings.

The compressor, turbine, and combustion chamber are carried as a unit on the underbody by fixed and sliding supports, arranged to give complete freedom for expansion. The output is absorbed in three main generators, an auxiliary generator, and an exciter, all of which run at 1,600 r.p.m. at full load.

Power transmission from the turbine is by a single reduction gearbox with one central 7,000-r.p.m. single helical pinion

and two 1,600-r.p.m. gearwheels disposed with their axes in a horizontal plane. One of the low-speed shafts drives two main generators and the other drives one main generator and the auxiliary generator and exciter. All five electrical machines are built together as a unit, and, together with the gearbox, are carried on the underbody that supports the gas turbine. This 27-ft. long power unit is carried on three supports on the locomotive underframe and disposed approximately centrally in the body with a passage way on each side.

Generators

Each of the three main generators supplies power to two axle-mounted traction motors which drive their axles through torsionally resilient single-reduction spur gears. The auxiliary generator provides power for the locomotive auxiliaries, which include a storage battery for starting the turbine by using the main generators as motors for the time being.

Principal motor-driven auxiliaries are the pump unit for fuel and lubricant, cooling fan for the lubricant cooling radiator, air compressor and vacuum exhausters for the locomotive and train brakes, and the forced ventilation blowers for the traction motors. A semi-automatic oil-fired boiler supplies steam at 80 lb. per sq. in. for heating the train through its normal heating system.

All the air for the gas turbine is filtered through dry fabric filter panels set in the walls of the machine compartment. These will free the air of all impurities, except those of very fine particle size, and extend the periods between blade cleaning operations.

This locomotive is of the conventional double-bogie type, with a driving cab at each end of the superstructure, so that it can be operated equally well in each direction. Each bogie has three axles and all axles are motor-driven.

The N.T.P. rating of the turbine is 3,500 h.p. at 7,000 r.p.m., and, when due allowance is made for summer temperatures, average altitudes, auxiliary demands, and transmission losses, power available at the rails is approximately 2,700 h.p., varying only slightly over the normal speed range. Between the limits of 90 m.p.h. maximum speed and 60,000 lb. maximum tractive effort the control equipment sets the fuel input and regulates the generator and motor-field strengths to maintain the turbine output steady at the value selected by the driver on the master controller irrespective of variations in train speed with changing gradients.

Estimated train resistance curves show that a 650-ton passenger train of 18 coaches will balance at over 80 m.p.h. on level track and at about 45 m.p.h. and 25 m.p.h. at gradients of 1 in 100 and 1 in 50 respectively. Similarly a goods train of 1,000 tons can be hauled up a 1 in 100 gradient at from 25 to 30 m.p.h. Power would have to be reduced, however, to keep within safe speed limits on level track.

Thermal Efficiency

Full-load thermal efficiency of the turbine is calculated at about 20 per cent., falling to about 16.5 per cent. at half-load, and the overall efficiency to the rails will be about twice that of a modern steam locomotive. Gas oil will be the fuel for both the turbine and the train-heating boiler.

From the driving point of view the control of the power plant is reduced to extreme simplicity so that attention can remain concentrated on the road ahead and its signals. Driving controls comprise

a reversing lever and a power lever in addition to those for brakes, sanders, and other functions. By the power lever the driver selects the proportion of full load at which he wishes the turbine to be automatically controlled.

Principal Particulars

The principal particulars of the Metropolitan-Vickers locomotive are as follow:

Length over buffers	66 ft. 8 in.
Bogie wheelbase	15 ft.
Bogie centres	37 ft. 10 in.
Total wheelbase	53 ft.
Body width	9 ft.
Height above rail	12 ft. 10 in.
Total weight	120 tons
Adhesive weight	120 tons
Maximum speed	90 m.p.h.
Maximum tractive effort	60,000 lb.
Continuous rating tractive effort	29,000 lb.

The power unit of the above locomotive is in a well-advanced stage of construction and progress has been made in the design of the mechanical parts.

Brown-Boveri Gas Turbine

It is anticipated that the Brown-Boveri gas turbine-electric locomotive will be delivered to British Railways in June this year. The construction of both the power unit and the chassis is expected to commence this month. Bench tests of the power unit will be made towards the end of March and load trials of the locomotive have been arranged to take place on the Swiss Federal Railways in June.

The Brown-Boveri unit follows the 1946 design very closely, details of which were given in our issue of November 22, 1946, and it will be basically similar to the one built by the same firm for the Swiss Federal Railways in 1941, which up to the present is the only locomotive of its kind in regular service. The new locomotive will, however, incorporate several improvements, including a rather higher capacity.

Briefly, the unit consists, essentially, of an axial-flow compressor, heat exchanger, combustion chamber, and gas turbine. The compressor is driven by the turbine, and the air, compressed to about 45 lb. per sq. in. in the compressor, is fed to the combustion chamber through the heat exchanger. In the combustion chamber the fuel oil is consumed with only a portion of this air, the remaining—and much greater—portion of the air by-passing the actual combustion chamber, and mixing with the products of combustion so as to reduce the combustion temperature to a maximum of about 1,100° F. before the turbine.

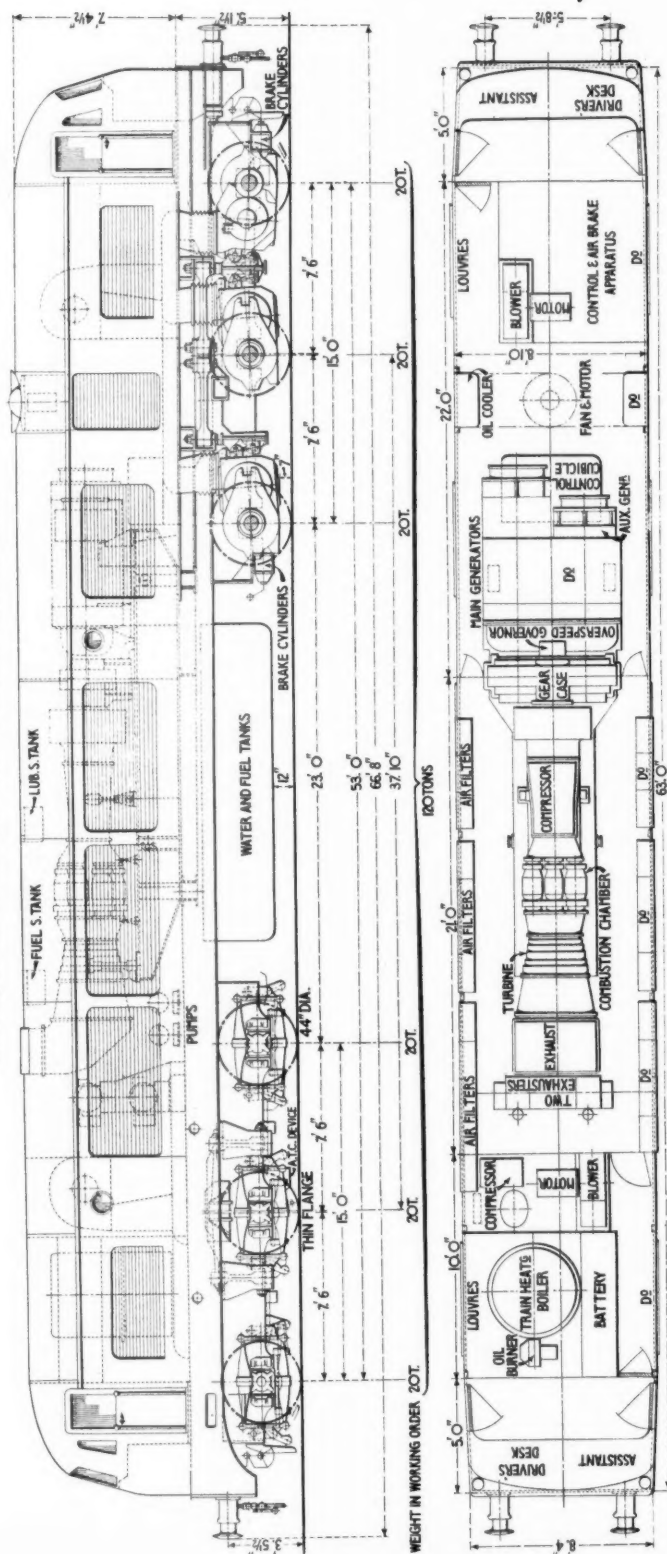
This mixture of air and products of combustion is expanded through the turbine, and useful work is produced. The turbine exhaust gases escape to the atmosphere through the roof of the locomotive after passing through the heat exchanger. In the heat exchanger a portion of the heat in the exhaust gases is transferred to the air which is being delivered to the combustion chamber, the temperature of the air being thus raised to about 500° F.

Horsepower Developed

At full load the turbine develops about 10,300 h.p., the compressor absorbs about 7,800 h.p., and the difference of 2,500 h.p. is transmitted to the generator set through a reduction gear. The function of the electrical equipment is to convert the available mechanical energy produced by the gas turbine unit into electrical energy and to transmit this to the driving axles by means of electric motors.

The locomotive is carried on two six-

Metropolitan-Vickers Gas Turbine Locomotive



Elevation and plan of Metropolitan-Vickers mixed-traffic and passenger gas turbine-electric locomotive

wheel bogies, and each outer axle of each bogie is driven by a series-type d.c. motor, completely suspended to reduce the unsprung weight to a bare minimum. A driving cab giving an unobstructed lookout is provided at each end of the locomotive, as it is equally suitable for running in either direction without turning. One-man control is provided as well as standard Western Region automatic train control apparatus.

As compared with a highly efficient express steam locomotive the fuel consumption of the gas turbine-electric unit is expected to be less than half for equal work done.

Principal Particulars

The principal details of the Brown-Boveri locomotive for the Western Region are as follows:—

Continuous net output of gas turbine unit ...	2,500 h.p.
T.E. at wheel rim at starting ...	31,500 lb. up to about 21 m.p.h.
T.E. at wheel rim continuously ...	12,400 lb. at about 64 m.p.h.
Maximum continuous speed ...	90 m.p.h.
Weight in running order ...	115 tons (approx.)
Weight for braking ...	115 tons (approx.)
Adhesive weight ...	77 tons (approx.)
Length overall ...	62 ft. 11½ in.
Fuel ...	Furnace fuel oil

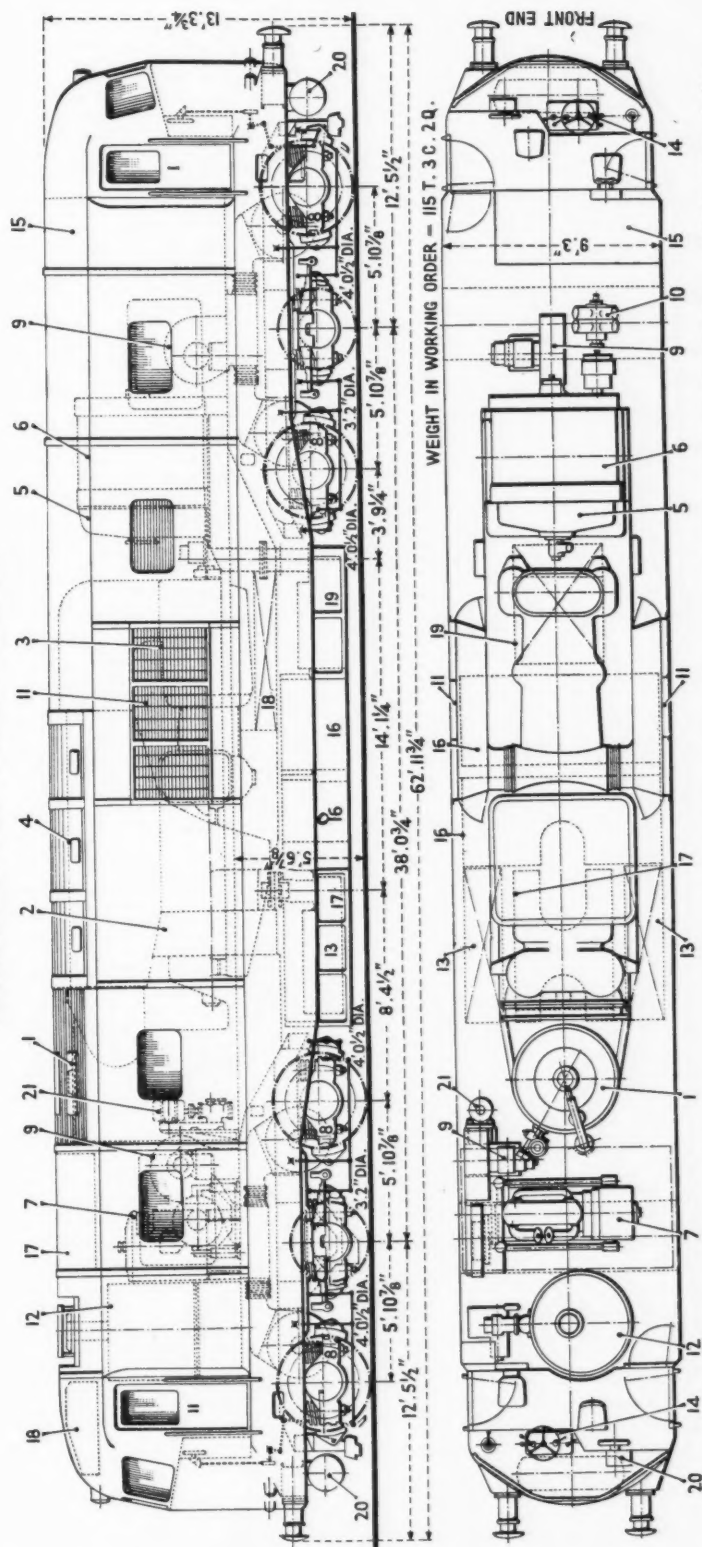
The locomotive carries sufficient fuel for 250 miles or for non-stop runs from Paddington to Plymouth.

The design and construction of the locomotive is being carried out by Brown-Boveri & Company, at Baden, Switzerland, while the supply of the mechanical parts has been entrusted to the Swiss Locomotive & Machine Works at Winterthur.

RETAIL PRICES INDEX.—At November 16 the official interim index figure, which measures changes in the average level of retail prices compared with the level at the base date, June 17, 1947 (taken as 100), was 109, compared with 108 at October 12.

NORWEGIAN RAILWAY EXPANSION.—In a recent speech at Trondheim Mr. T. Heiberg, a director of the Norwegian State Railways, gave some interesting details regarding the Norwegian railways. He said that the total cost of railway construction in Norway in almost 100 years amounted to 1½ milliard kroner, and the current value represents appr. 5 milliard kroner, he said. Since 1938 the total length of the railways increased from 3,800 km. to 4,400 km., or 15 per cent. The number of staff increased rather out of proportion (by 45 per cent.), but it should be borne in mind that the railways now carried record traffic as compared with pre-war figures. Goods traffic had increased by 30-40 per cent. since before the war. Expenditure had greatly increased; for instance, the price of coal had gone up to 320 per cent. of the pre-war normal. Mr. Heiberg stressed the necessity of increased grants by Parliament for maintenance of the railways and said that more understanding of this fact had been shown lately.

Brown-Boveri Gas Turbine Locomotive



1. Combustion chamber, 2. Gas turbine, 3. Air compressor, 4. Air preheater, 5. Reduction gear set, 6. Main generator, 7. Diesel generator set for auxiliaries, 8. Traction motors, 9. Fan, 10. Motor compressor and vacuum pump, 11. Lubricating-oil radiators, 12. Radiator, 13. Radiator, 14. Control apparatus, 15. Apparatus compartment, 16. Heavy fuel-oil tanks, 17. Water tank for boiler, 18. Light fuel-oil tank, 19. Lubricating-oil tank, 20. Air reservoir, 21. Light fuel-oil pump.

Elevation and plan of Brown-Boveri 2,500-h.p. gas turbine-electric locomotive for the Western Region of British Railways

Main-Line Deviation in Australia

Describing a new five-mile independently-aligned "up" line, including a 560-deg. spiral, on the Sydney-Albury main line, New South Wales

THE Sydney-Albury or southern main line of the New South Wales Government Railways is one of the most important in Australasia, as it is the N.S.W. part of the inter-State Sydney-Melbourne trunk route. At Albury the 4 ft. 8½ in. gauge line from Sydney makes connection with the 5 ft. 3 in. Victorian gauge line onwards to Melbourne, but the latter is to be converted to standard gauge in the near future, when inter-capital through running will be possible.

The bulk of the goods traffic over the Sydney-Albury route flows in the "up" direction towards Sydney, and its volume increases as that city is approached. Consequently, the doubling of the line had been gradually extended southwards from Sydney, until it had reached Cootamundra, an important junction 267 miles from the capital, where it ended until the war.

The capacity of the single line onwards was, however, severely taxed, and the section of it from Cootamundra to Junee, about 25 miles in length, especially so. The reason for this was that Junee is another important junction, where the main line is fed by two long branches traversing the Billabong and Murrum-

bidgee valleys, thus serving the whole of the southwest corner of the State, and, even more important, making an alternative connection with the Victorian railway system at Tocumwal. It was therefore decided to extend the double line from Cootamundra to Junee, and the work was completed in 1946.

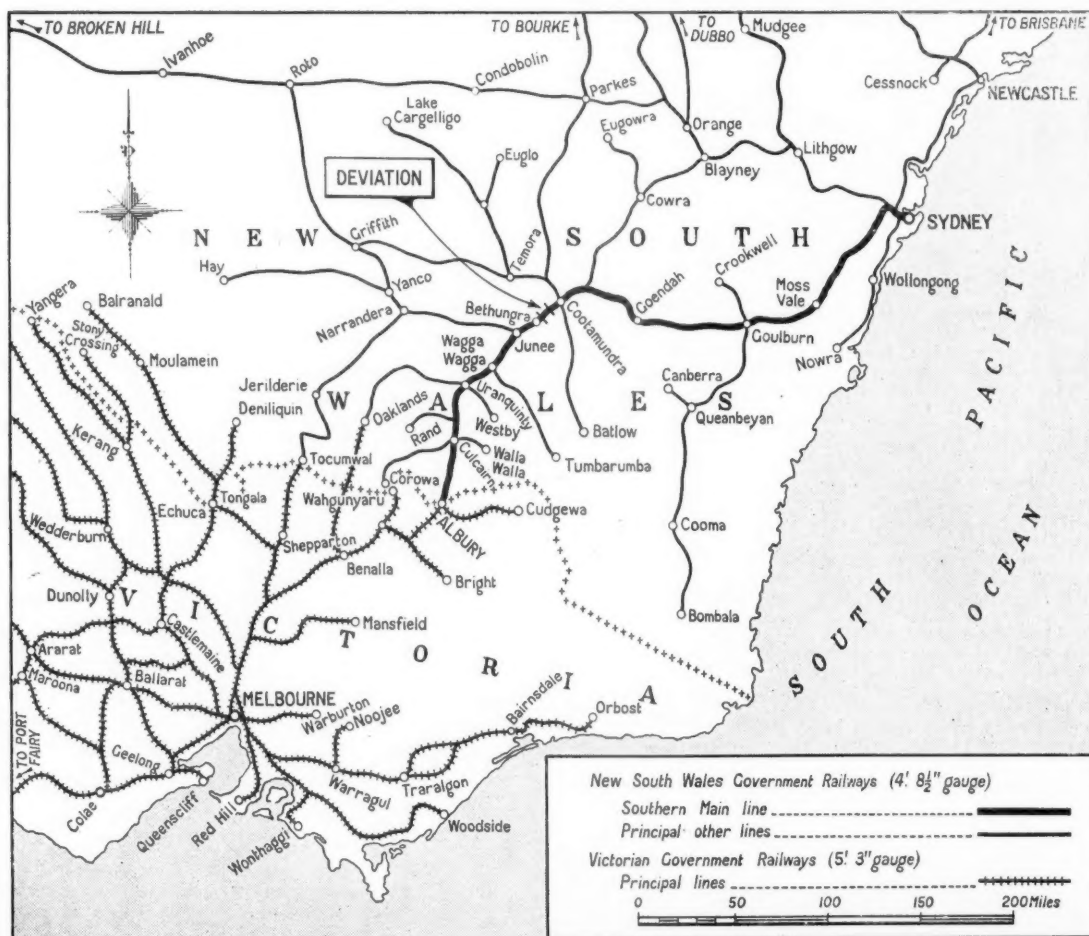
Banking Difficulties

Prior to duplication, this section had a ruling gradient of 1 in 75 uncompensated for curvature against the load, or against "up" trains, with the exception of a three-mile bank beginning at Bethungra station with 1½ miles of 1 in 45, followed by ¾ mile at 1 in 40, and ending with ½ mile at 1 in 49 at Tanyinna crossing loop, at the summit. As a result, the standard 2-8-0-type goods locomotive with a through single load on the "up" journey of 640 tons, could haul only 340 tons up this Bethungra bank, and an assistant engine had to be used. Latterly, this practice became complicated by the fact that the local locomotive water supply had so greatly deteriorated in quality that the assistant engine had to be replaced after each trip to enable it to obtain water elsewhere. The operating bottle-

neck at this point had therefore to be considered when the decision was taken to proceed with the doubling. A second track had to be constructed; could this at reasonable cost be so aligned as to provide a ruling grade of 1 in 75 uncompensated for curves, and so conform to the administration's policy of having no steeper "up" grade throughout the main line? This was the problem faced by the survey engineers. Much was at stake, for if such an alignment could be located, it would be possible for the newer D-57 class three-cylinder 4-8-2-type goods engine to haul a 1,000-ton load throughout from Junee to Sydney.

Spiral Loop to Ease Gradient

Fortunately, the engineers were favoured by the terrain in this length, which included an almost ideal topographical feature in the shape of a conical hill—or more correctly a conical knoll on a hill spur—close beside the old alignment. It was found possible to develop sufficient additional length of line round this knoll, in the form of a complete spiral loop, to secure a ruling grade of 1 in 66 compensated for curvature—almost continuous 14-ch. rad. curves—roughly the equivalent of 1 in 75 uncompensated. Moreover, the neck joining this knoll with the higher part of the spur provided the necessary supporting ground for the upper approach of the new line from the Sydney direction



Position of the Tanyinna-Bethungra deviation on the Sydney-Albury-Melbourne through route

or from the top of the incline. It was found that, after encircling the knoll, the line could cut through this neck and, in a short tunnel, cross under the upper part of the spiral loop it had just made in its descent from the top of the neck. In this way the additional 1 mile 58 ch. of line developed, as compared with the old alignment, made not only a 1 in 66 grade possible, but also a break of 10 ch. level in the otherwise continuous incline. The plan and longitudinal section reproduced explain the features of the new alignment better than any description. The generally favourable report of the surveyors was accepted, and the construction of an independent "up" line on the new alignment they recommended was sanctioned.

Route of Deviation

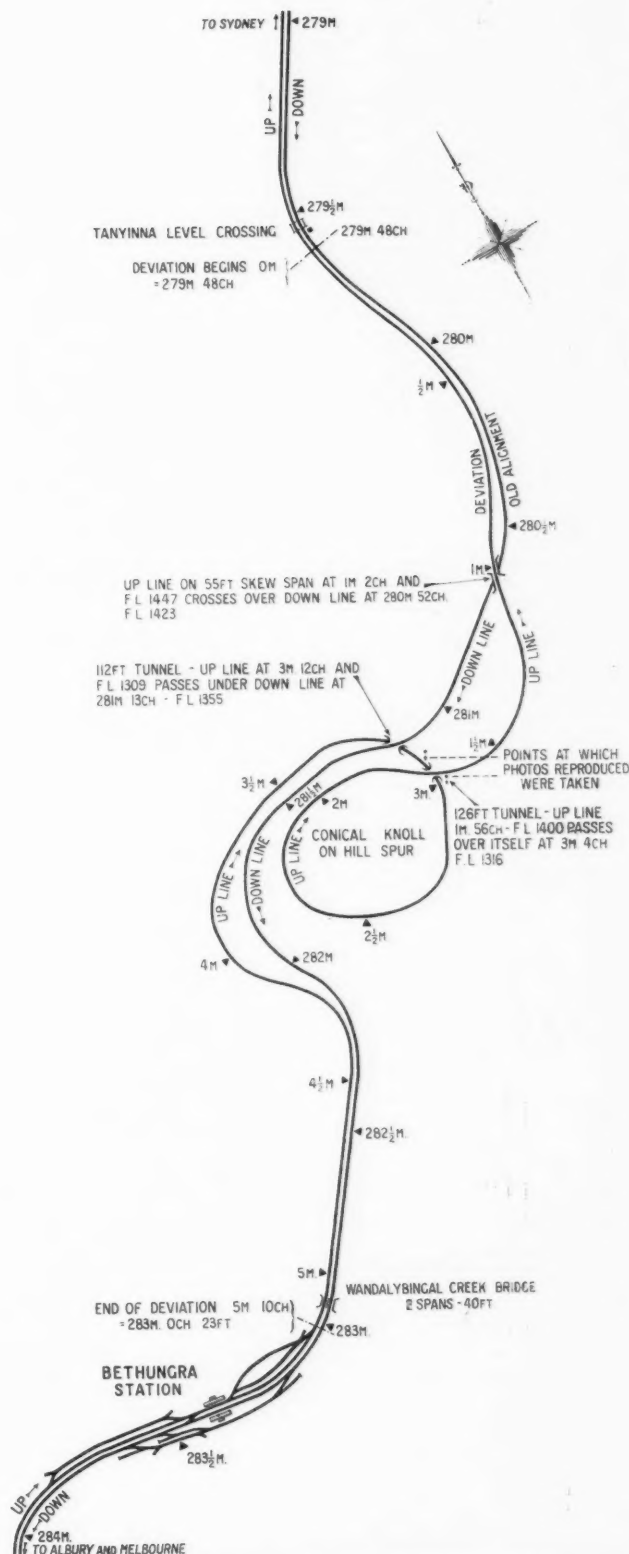
The mileage zero of the new "up" line deviation is at a point near Tanyinna level crossing, and 279 miles 48 ch. from Sydney. The "down" line, or old alignment, is closely followed, but with an increasing difference of levels, to just beyond mile 1, where the new line crosses over the old, on a 55-ft. skew steel and concrete bridge. The new line then swings southeastwards to keep on supporting ground in the course of the next half-mile, but the terrain here becomes very rough and broken, being composed of a granite-like rock. Alternating banks, up to 53 ft. in height, and cuttings with depths as great as 40 ft. were therefore necessary.

At mile 1—ch. 56, the new "up" line crosses the neck of the spur mentioned above virtually at ground level, and passes over the lower part of the spiral loop 84 ft. below. It then enters the loop high up the hillside above the "down" line, and still higher above the lower part of its own spiral loop. As the diagram shows, mile-post 2 on the deviation, mile-post 281½ on the "down" line, and mile-post 3½ again on the deviation loop, are almost directly above one another, the three tracks here running in roughly parallel curves on different contours of the knoll.

Spiral Loop Round Knoll

Continuing to swing leftwards from mile 2 in almost unbroken 14-ch. curve past mile-post 2½, the "up" line deviation enters a rapidly-deepening rock cutting at mile 2¾, and at mile-post 3 this has a depth of over 80 ft. Just beyond, the cutting gives place to the 126-ft. tunnel in which the new line passes under its own upper section 84-ft. above, a complete spiral loop being thus located. The deviation, however, still swings leftwards from this tunnel in a deep cutting and, 8 ch. beyond, passes under the "down" line in a second tunnel 112 ft. in length. The widening spiral continues for another mile and turns through about 560 deg. in its total length of over two miles, though its beginning and end points are well under ½ mile apart as the crow flies. The cutting, too, continues for some distance and is altogether some 52 ch. in length.

There are no further particular features of interest until mile 5 is reached, where Wandalybingal Creek is crossed on another concrete and steel bridge having two spans each of 40 ft. Rail level is here 42 ft. above the bed of the creek. The deviation ends just beyond this bridge, its final mileage, 5 miles 10 ch., corresponding with the through mileage by the old or "down" alignment of 283 miles



Plan of "up" line deviation between Tanyinna and Bethungra, New South Wales

0 ch. 23 ft. Bethungra station yard is also entered at this point.

Gradients and Curves

From the longitudinal section reproduced, it will be seen that the deviation begins virtually at the apex of the two inclines which actually occurs at mile 279 ch. 57, the formation level at this point being 1,515 ft. above datum. It then falls continuously at 1 in 66 compensated for 2 miles 50 ch., whereafter there is a 10-ch. break in the descent, formation level being 1,334 ft. The remaining 2 miles 28 ch. are again continuously graded at 1 in 66 compensated, and, at the point where the old alignment is rejoined, formation level is 1,151 ft. There is thus a rise of 364 ft. to be faced

by "up" trains on leaving Bethungra for Tanyinna, spread over a distance of 5 miles. The curves are also shown on the longitudinal section; it will be noticed that between miles 1 and 4½ they vary between 20-ch. and 14-ch. radius, the spiral loop consisting of three of the latter in practically continuous succession. The compensation for each curve has been worked out separately, and ample transitions have been allowed. Easy vertical curves have also been interpolated at changes of gradient.

Constructional Details

As will be clear from the description above, the engineering construction work on the deviation was heavy. Total excavation amounted to about 350,000 cu.

yd., and almost all of it was in solid hard rock. So difficult was this material to work that in the lower levels of the cuttings rock-drill bits had to be changed after boring only about 1 in. in any bore hole, and a special gang of blacksmiths and sharpeners had to be employed constantly to maintain the supply of tools.

This granitic rock, however, when selected and crushed, provided excellent aggregate for concrete, which was, therefore, used for the bridge pier and abutments, tunnel portals, arches and side walls. In the arch and walls of the 126-ft. tunnel the concrete was placed with a pneumatic gun, working at 100 lb. per sq. pressure, maintained by an electrically-driven compressor. For the 112-ft. tunnel, however, the concrete was poured with elevated skips. The portals of both tunnels were poured continuously by gravity through diagonal chutes and collapsible kibbles from the tops of the cuttings.

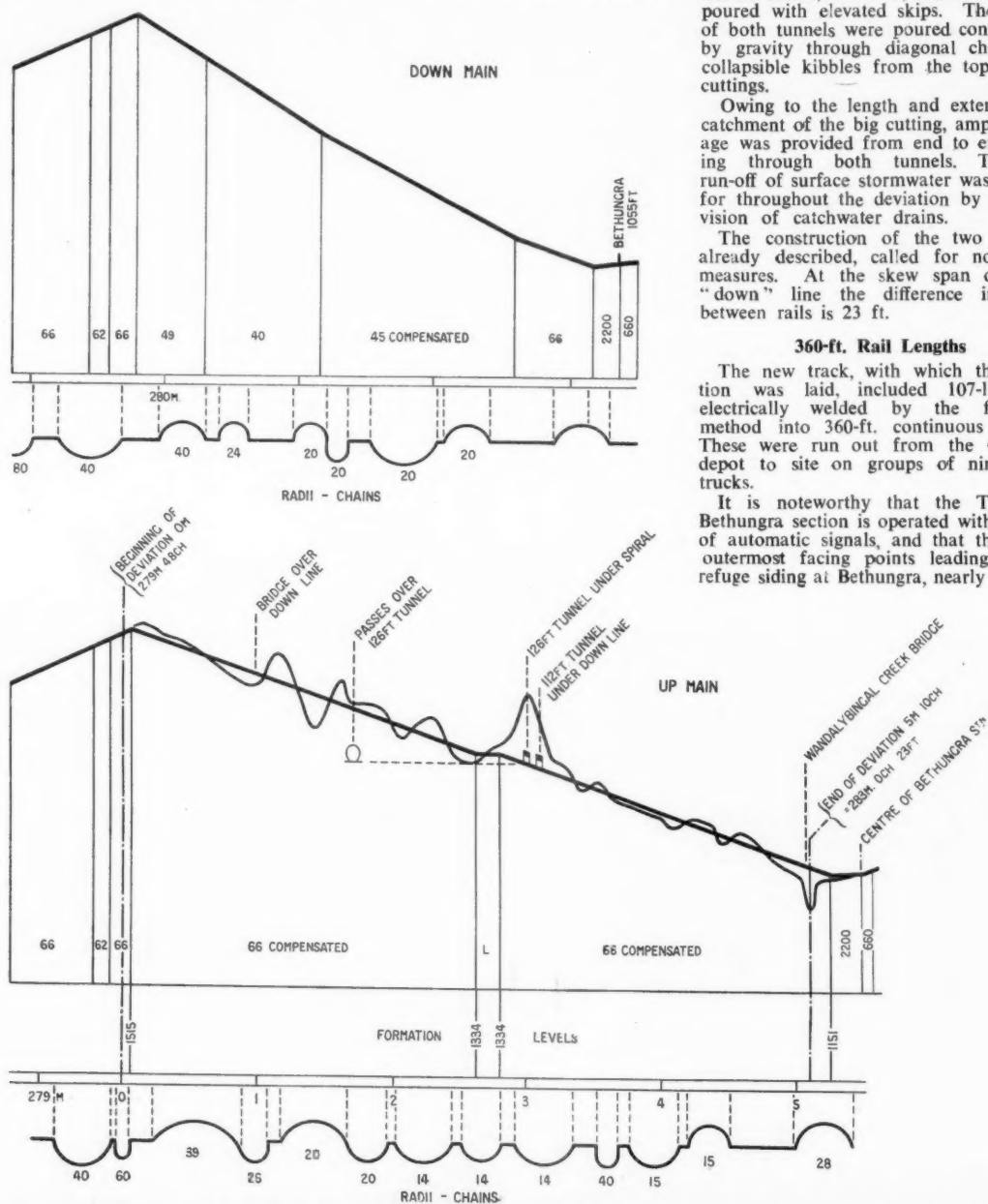
Owing to the length and extent of the catchment of the big cutting, ample drainage was provided from end to end, passing through both tunnels. The fast run-off of surface stormwater was allowed for throughout the deviation by the provision of catchwater drains.

The construction of the two bridges, already described, called for no special measures. At the skew span over the "down" line the difference in levels between rails is 23 ft.

360-ft. Rail Lengths

The new track, with which the deviation was laid, included 107-lb. rails, electrically welded by the flash-butt method into 360-ft. continuous lengths. These were run out from the Chullora depot to site on groups of nine bogie trucks.

It is noteworthy that the Tanyinna-Bethungra section is operated with the aid of automatic signals, and that the "up" outermost facing points leading to the refuge siding at Bethungra, nearly 2,700 ft.

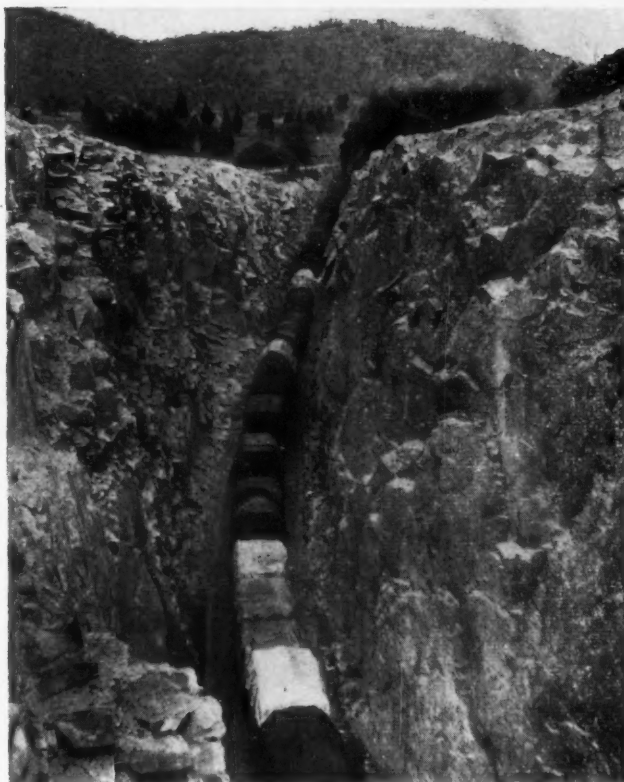


Gradient profile of new "down" line (old single line), and longitudinal section of new "up" line as regraded and realigned

from the signal box, are worked by an electric motor.

The whole of the work was carried out departmentally by the railway staff, and the new "up" line was completed and opened for traffic on July 15, 1946. We are indebted to the N.S.W.G.R. administration for the information on which this article is based. Some notes on engine loads, traffic working, and survey work for this deviation are embodied in an editorial article on page 32.

A STANDARD WAGON FOR EUROPE.—Within the framework of the Marshall Plan the technical committees of the Economic Co-operation Administration and the Organisation of European Economic Co-operation have begun to tackle the problem of the efficiency of railway transport in Europe. With a view to simplifying the technical day-to-day problems in railway transport it has been decided to recommend the unification of the construction of goods wagons by adopting a standard type of wagon. The problem is closely linked with modernisation of the goods rolling stock generally. Studies by railway experts of the O.E.E.C. have revealed that much of the goods rolling stock of the E.R.P. countries consists of old vehicles dating from the early years of the present century. Also, it has been calculated that unserviceable wagons total about 15 per cent. of the whole of the European goods rolling stock. These wagons, too, should be replaced by vehicles of the unified standard type. A first step towards this and the unification of technical equipment pending the introduction of the standard wagon, was the recommendation made some time ago for the general adoption of automatic couplings, of which mention was made in our November 12 issue.



"Up" goods train ascending 1 in 66 gradient in deep cutting after leaving tunnel depicted below. The line makes a complete loop to the right to pass over this tunnel



Lower portal of 126-ft. tunnel near mile 3. A goods train has passed through the tunnel and climbed round the spiral loop, passing over it at mile 1—ch. 56

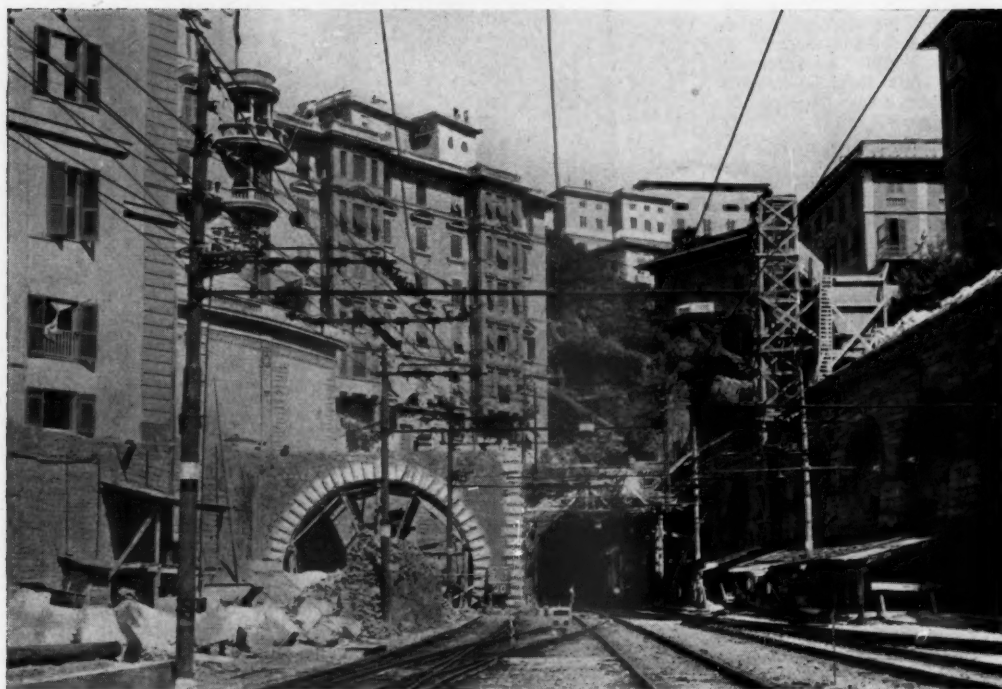
HALE & HALE (TIPTON) LIMITED.—The profit and loss account for the year ended August 4 shows a trading profit of £43,815, to which is added dividends received from two subsidiaries in respect of the period April 1, 1947, to August 4, 1947, amounting to £12,903, and other investment in-

come of £555, totalling £57,278. The net profit was £25,405, against £18,902, and it has been decided to pay a final dividend on the ordinary shares of 15 per cent., less tax, making 20 per cent. for the year. Mr. W. Edgar Hale, Chairman, said at the recent annual meeting that

during the past twelve months there had been an appreciable increase in sales turnover and tonnage output, and, although they were still unable to meet fully the demands made on them, every avenue was being explored to increase output still further.

Railway Improvements at Genoa

(See article in May 7, 1948, issue)



Work at Brignole Station end of new tunnel under Genoa, parallel with existing tunnel. The building immediately above the new portal required careful under-pinning



Demolition of retaining wall adjoining through platforms at Principe Station for approach to new tunnel. In the centre are the terminal platforms, formerly covered by a glass roof which was wrecked during the war

RAILWAY NEWS SECTION

PERSONAL

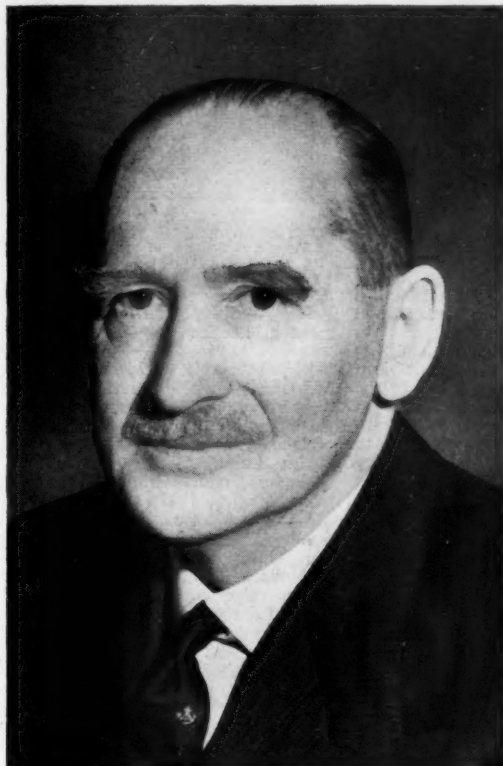
Mr. William Bell Common has been elected a Director of the San Paulo (Brazilian) Railway Co. Ltd., in place of the late Mr. Vernon Hinde.

Sir James Milne, who in January, 1948, was appointed a Director of the Nyasaland Railways Limited, as a representative of the Nyasaland Government, is paying a visit to Nyasaland.

Deputy Adjutant-General; and finally Quartermaster-General. In the last-named capacity he was responsible for the feeding, clothing, housing, and movement of the Army, including all questions of transportation.

Monsieur Robert Henri Le Besnerais, formerly General Manager of the French National Railways Company, whose death we recorded briefly last week, was born on July 3, 1893. After attending the Ecole

dency, he became Honorary President. During the 1914 war he served as an artillery officer, and was awarded the Croix de Guerre; he received a similar award in the 1939-40 French war. In 1929, he became a Chevalier of the Legion of Honour, and in 1936 an Officer of that order. He was a C.B.E., and was decorated with several other foreign orders. He died in Paris on December 23 last, and was buried on December 28, in the Père-Lachaise Cemetery.



General Sir Daril Watson

Appointed a Member of the Railway Executive



The late M. Robert Le Besnerais

General Manager, French National Railways, 1938-45

General Sir Daril Watson, G.C.B., C.B.E., M.C., who, as recorded in our last week's issue, has been appointed a Member of the Railway Executive, joined the Royal Mail Steam Packet Company at the age of 15, and served with it at home and abroad. In 1914, while on leave from Brazil, he joined the Army as a private; and he received a regular commission in 1915 in the Highland Light Infantry, as Captain. He joined the Duke of Cornwall's Light Infantry in 1928, and commanded the 1st Battalion. Subsequently he officiated as the Commander of the Rasmek Brigade on the North West Frontier, and later became Commandant of the Senior Officers' School in India. At the outbreak of war in 1939 he was Brigadier of the General Staff at Eastern Command, and he went overseas as Brigadier, General Staff, 3rd Corps. He later took command of the 2nd Division, and then went to the War Office as Director of Special Duties, subsequently becoming, successively, Assistant Chief of the Imperial General Staff;

Polytechnique and the Ecole Supérieure des Mines, he became Mines Engineer at Nancy. He joined the Northern Railway of France in 1924 and rose rapidly until he attained the rank of Ingénieur-en-Chef de l'Exploitation. He was appointed General Manager (Directeur de l'Exploitation) at the beginning of 1934, and continued as such until the grouping of the French railways from January 1, 1938, when he became General Manager of the French National Railways Company. This office he held throughout the whole of the war period, and kept the French National Railways system working to the best of his ability, particularly during the difficult years of partition between "occupied" and Vichy France, in the interests of the life of the country. He was succeeded as General Manager in the early part of 1945 by M. Jean Goursat, but continued as President of the U.I.C. (International Union of Railways), an office in the nomination of the French National Railways. On his retirement from the Presi-

Mr. A. C. Ahlston, Chief Mechanical Engineer, Victorian Government Railways, recently arrived in Great Britain on a visit.

Mr. T. G. Creighton, Director, Mechanical Engineering & Stores, Railway Division, Government of Pakistan, recently returned to Pakistan after a brief visit to this country.

Mr. Duncan Bailey, O.B.E., has resigned his position as Joint Managing Director of Charles Roberts & Co. Ltd., Wakefield, but, at the request of the board, retains his position as Chairman. He has served the company for 49 years, 32 of them as Managing Director, and was appointed Chairman in 1927. His son, Mr. Russell Bailey, O.B.E., has been made Managing Director. Mr. Russell Bailey was educated at Bromsgrove School and was a scholar of Clare College, Cambridge; he served two years in the locomotive shops at Doncaster, joining Charles Roberts & Co. Ltd. in 1921.

**Mr. H. D. Ward Smith**

Appointed Assistant Chief Stores Superintendent,
South African Railways

**Mr. W. H. Maass**

Appointed Advisory Engineer, South African
Railways, London

**Mr. S. G. Jones**

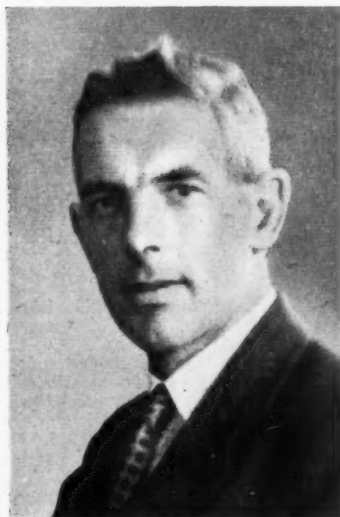
Appointed Solicitor to the London Transport
Executive

Mr. H. D. Ward Smith, O.B.E., E.D., A.M.I.Mech.E., Advisory Engineer, South African Railways, Office of the High Commissioner for South Africa, London, who, as recorded in our last week's issue, is returning to South Africa to take up the appointment of Assistant Chief Stores Superintendent, South African Railways, was born in the Orange Free State on December 21, 1896, and, after being educated at public schools at Bloemfontein and East London, was apprenticed to the South African Railways. He enlisted in 1915 with the 1st South African Brigade, and served in Egypt and France until 1918, when he transferred to the R.A.F., in which he was commissioned in the next year. He returned to South Africa and completed his apprenticeship in 1923, studying also at East London and Pretoria Technical Colleges. In 1923 Mr. Ward Smith joined the C.M.E. locomotive drawing office, and he thereafter held various positions until appointed Assistant Mechanical Engineer at Uitenhage work-

shops in 1938. After acting as Mechanical Engineer for a year, he was appointed, in 1939, Locomotive Superintendent, Eastern Transvaal System. Since 1927 he had been actively connected with the South African Engineer Corps, of which he is one of the founders; and in May, 1940, he proceeded on service in command of 16 Field Company, S.A.E.C., the first field company to proceed on active service. After serving in East Africa, Italian Somaliland and Abyssinia, he went to Egypt in August, 1941, as C.R.E., 1st South African Division, with which he served in North Africa until July, 1942, when he was recalled to South Africa to become C.R.E. Coastal Area, Cape Town. For his war services he was made an O.B.E., in addition to which he holds the Efficiency Decoration for volunteer service in the Union Defence Force. In October, 1943, Mr. Ward Smith was recalled to railway duties and resumed as Locomotive Superintendent, Eastern Transvaal System. From September, 1945, until January, 1946, he

acted as Chief Superintendent (Motive Power), and thereafter took up his appointment in London.

Mr. W. H. Maass, M.I.Mech.E., M.I.Loco.E., who, as recorded in our last week's issue, has been appointed Advisory Engineer, South African Railways, Office of the High Commissioner for South Africa, London, was Assistant Advisory Engineer (and Acting Advisory Engineer from January, 1941, to November, 1945), S.A.R., London, until he left in 1946 for South Africa to become Mechanical Engineer, East London. He was born at Lydenburg, Transvaal, where he completed his secondary education. On matriculating he joined the South African Railways as an apprentice fitter in the Pretoria workshops in 1924. He pursued technical studies at the Pretoria Technical College, and in 1929 was selected for appointment as a pupil mechanical engineer. In 1931 he was transferred to gain overseas experience by serving on the staff of the

**Mr. J. M. Fleming**

Appointed District Commercial Superintendent
(Goods), Glasgow, Scottish Region

**Mr. G. H. Brown**

Appointed General Manager for the East,
Thos. Cook & Son Ltd.

**Mr. C. M. Squarey**

Appointed Ocean Travel Manager,
Thos. Cook & Son Ltd.

Advisory Engineer, London, and in 1934 returned to South Africa and assisted in establishing the South African Railways inspection organisation at the then newly-established Iscor Steelworks. In the next year he was appointed to the Salt River workshops as Assistant Engineer (Mechanical), and in April, 1937, renewed his association with the Advisory Engineer's Office, London, in the capacity of Acting Assistant Advisory Engineer, in which position he was confirmed in September of that year; from the beginning of 1941 to November, 1945, he was Acting Advisory Engineer. During the war years he served as the High Commissioner's technical representative on the Commonwealth Supply Council (Railway Equipment) set up by the Ministry of Production for the purpose of screening priorities and to advise on the allocation of available capacity for the production of locomotives and other rolling stock. In 1946 Mr. Maass returned to South Africa as Mechanical Engineer, East London.

Mr. Stephen G. Jones, who has been appointed Solicitor to the London Transport Executive, is 45 years of age, and entered the Legal & Parliamentary Office of the Underground group of companies in 1929. On the formation of the L.P.T.B. he was transferred to the Solicitor's Office as Conveyancing Assistant, becoming a Senior Assistant in the same office in 1936, and chief Assistant to the Assistant Solicitor (General) in 1940. He was admitted a solicitor in 1938. Mr. Jones was appointed Acting Assistant Solicitor (General) in October, 1947, and in April, 1948, was appointed an Officer of the London Transport Executive with the title of Assistant Solicitor (General).

Mr. J. M. Fleming, who, as recorded in our last week's issue, has been appointed District Commercial Superintendent (Goods), Glasgow, Scottish Region, British Railways, was educated at Christ's Hospital, Horsham, and Clare College, Cambridge, and entered L.N.E.R. service in the Scottish Area in 1928 as a traffic apprentice. He went to the Goods Manager's Office, Glasgow, in 1932, and from 1933-38 served in the Chief General Manager's Office, Kings Cross. Mr. Fleming was Assistant to Locomotive Running Superintendent, York, from 1938-41. He then became Acting Assistant District Superintendent, Hull, and in 1942 was appointed Head of Works Section, Chief General Manager's Office. He was made Acting District Goods & Passenger Manager, Peterborough, in December, 1943, and was confirmed permanently in that post in 1945. In October, 1946, he was appointed District Goods & Passenger Manager, Edinburgh, and in November, 1947, Assistant Goods Manager, Scottish Area.

Mr. G. H. Brown, who, as recorded in our last week's issue, has been appointed General Manager for the East, Thos. Cook & Son Ltd., is 44 years of age. He entered the company's service at the original Ludgate Circus office, and was transferred in 1926 to Cairo. In 1935 he went to Bombay as Passage Assistant; and he was appointed Bombay Branch Manager in 1945. Mr. Brown returned to London in the summer of 1947 as Ocean Travel Manager, at the company's head office.

Mr. C. M. Squarey, who, as recorded in our last week's issue, has been appointed Ocean Travel Manager, Thos. Cook & Son Ltd., served for 15 years with the Cunard

Company before joining Thos. Cook & Son in 1935. He gained valuable experience when appointed to Australia for some two-and-a-half years as the Cunard Company's representative, and later on, when for five years he was its delegate in the Far East, based at Shanghai, where he opened an office for the company. During the recent war Mr. Squarey was stationed in Iceland, Gibraltar, North Africa and Italy. On demobilisation he was appointed Traffic Manager for overseas territories for Thos. Cook & Son, which post involved extensive travelling; in the last two years his duties have taken him to Egypt, East Africa, South Africa, Australia, New Zealand, China, Malaya, Burma, India, Pakistan, Ceylon, Iraq, Cyprus, Malta and Gibraltar.

BRITISH TRANSPORT COMMISSION

The British Transport Commission announces changes in the titles of the following officers (no alteration in responsibility or authority is involved):—

Department of Chief Secretary & Legal Adviser

Mr. Frank Gilbert, Assistant Secretary (Staff & Establishment), to be Principal Staff Officer.

Mr. M. R. Bonavia, Assistant Secretary (Works & Development), to be Principal Works & Development Officer.

Mr. M. A. Cameron, Assistant Secretary (Traffic), to be Principal Traffic Officer.

Mr. R. Byron-Scott and Mr. D. Robertson, Senior Secretarial Assistants, to be Staff Officers.

Mr. L. B. Marson and Mr. R. B. Lewis, Senior Secretarial Assistants, to be Works Officers.

Mr. W. C. Collins, Senior Secretarial Assistant, to be Traffic Officer.

Senhor Machado, Director of the Currency & Credits Division, Bank of Brazil, left Rio de Janeiro recently by air for

Lisbon, where he intends staying a few days before coming on to London. Dr. Manoel Leao, Brazilian representative of the Great Western of Brazil Railway Co. Ltd., is also expected to visit London soon.

Mr. S. H. Fisher has been appointed a Director of the Trent Motor Traction Co. Ltd., in place of Mr. T. W. Royle, who has resigned.

Mr. P. N. Kerney has been appointed Fire Officer, Southern Region, British Railways, in place of Mr. D. J. Erlebach, who has resigned.

Mr. G. J. Hastie, Chief Mechanical Engineer, Tasmania Government Railways, expects to arrive in Great Britain shortly on a visit of some two months duration.

The Board of Trade has announced the appointment of the following as members of the Monopolies & Restrictive Practices Commission:—

Sir Archibald Carter (Chairman); Mr. C. N. Gallie; Mr. Frederick Grant; Mrs. Joan Robinson; Sir Harold Saunders; Mr. Gordon Stott; Mr. Josiah Wedgwood; Mr. R. E. Yeabsley.

PRESENTATION TO MR. E. M. RUTTER

A gift of books was presented recently to Mr. E. M. Rutter, Superintendent, North Eastern Region, British Railways, who retired on December 31. Mr. C. P. Hopkins, Chief Regional Officer, presided, and both he and Mr. C. M. Jenkin Jones (retired Divisional General Manager, N.E. Area, L.N.E.R.) paid tributes to Mr. Rutter's long and faithful service. There were 45 officers present, including, in addition to Mr. Jenkin Jones, three retired L.N.E.R. officers, Messrs. S. T. Burgoyne (Passenger Manager, N.E. Area), F. E. Harrison (Assistant Chief Engineer), and J. E. Kitching (Mineral Manager, Southern Area).

Presentation to Mr. E. M. Rutter



A presentation was made recently to Mr. E. M. Rutter on his retirement as Superintendent, North Eastern Region (see paragraph above). Left to right: Mr. E. M. Rutter, Mr. C. M. Jenkin Jones, and Mr. C. P. Hopkins

Ministry of Transport Accident Report

*Near Wath Road Junction, British Railways,
London Midland Region: May 18, 1948*

Brigadier C. A. Langley inquired into the accident, which occurred at about 3.52 p.m. on May 18, 1948, near Wath Road Junction, London Midland Region, when the 11.45 a.m. express, St. Pancras to Bradford, composed of 12 coaches, hauled by two Class "5XP," 3-cylinder, 4-6-0 locomotives Nos. 5605 and 5609, became derailed on a 30 ft. embankment when running at 60 to 65 m.p.h. along a straight alignment, where rail expansion caused by the sun's heat had distorted the track. As a relief express, with the bulk of the travellers, had left St. Pancras 15 min. earlier, the derailed train was carrying 194 passengers only, but six were killed and one fatally injured, as was also the driver of the train engine. The accident was observed by the staff of the Manvers Main Colliery nearby and assistance was at once summoned and arrived speedily.

The colliery staff gave great assistance in extricating casualties, in spite of much difficulty and danger due to the precarious position of several of the coaches, settling into the soft ash of the embankment. Some had to be supported by pit props. The results of the derailment were serious and the accompanying plan, taken from that in the report, shows the final positions of the engines and coaches, with other relevant details. The weather had been warm and dry for several days and on the day of the accident was hot.

Due to colliery subsidence in the neighbourhood, the top of the formation and the ballast was laid with ashes, dry and dusty on the day of the accident. Ballast was 1 in. to 2 in. below the top of the sleepers, cress 1 ft. 6 in. below rail level, and the shoulder at the end of the sleepers only 6 in. instead of the standard 12 in.

The last mining subsidence at this particular place occurred in 1892, but in July, 1944, a coal seam was opened 70 yd. east of the railway. Brigadier Langley was satisfied, however, that there had been no settlement of the formation; its level was checked after the accident. The nearest recent subsidence had occurred three years before, $\frac{1}{2}$ mile to the north. A speed restriction of 40 m.p.h. was imposed and removed last autumn.

The track was of good quality with standard rails, which replaced 95 lb. sorbetic rails in 1946.

Brigadier Langley examined the track early on May 19, in cool weather with minimum temperature of 42° F. The rails on both sides of the derailment were in good order and weighed 92.4 lb. per yd., with no side cut or chair gall and only a little corrosion. Sleepers were sound and fastenings holding well. Expansion gaps varied from $\frac{1}{8}$ to $\frac{3}{8}$ in. There was no sign of rail creep, and at some of the wider gaps there was evidence of movement of the rails in the fishplates. The ganger stated that these had been oiled early in March, but it did not appear that the work had been done efficiently throughout. Several pairs were removed and it was noticed that the oil was not spread evenly along the fishing angles, rusted in places.

There was a cant deficiency varying from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. for 70 yd. at the north end of the circular curve in rear of the derailment. Near the transition point it was correct, but 10 yd. further there was another $\frac{3}{8}$ in. deficiency. Gauge of the circular curve was $\frac{1}{4}$ in. slack, on the

transition correct, but at one point on the straight $\frac{3}{8}$ in. tight. Top and alignment here were good with no serious sleeper depressions under load, but ahead of the derailment things were not so good and there were a number of "pumping" sleepers.

Examining the track again in warm weather on July 25, Brigadier Langley found a number of wide rail joints. Some were loosened and closed immediately by $\frac{1}{8}$ to $\frac{1}{4}$ in., indicating stress and tight fishplates.

The report gives a table of temperatures measured at Rotherham, 5 miles away, from May 1 to May 18; the sun temperature of 125° F. measured on the last-named date was high for the time of year, although on a number of occasions up to 130° F. had been recorded in the summer

more rolling and did not travel as fast as on other sections.

The two firemen could throw little light on the case and the guard and a travelling ticket collector noticed nothing unusual before the emergency brake application.

The enginemmen of an up goods line train saw the express approach and the pilot engine leave the rails, but did not see the train engine overturn due to the dust enveloping the scene.

The guard of the relief express—since deceased—which passed 8 min. before, experienced severe lurching between Wath Road Junction and Manvers Main signal boxes, causing him to stagger, and shaking down a parcel. He picked this up and looked out. The train had by then travelled some distance and he noticed nothing wrong on account of the dust. Though severe, the sway did not alarm him and he did not report it. Three passengers in this train also gave their experiences, showing how the rear coach, in the leading end of which the guard was riding, swayed violently, causing luggage to become dislodged.



Aerial view showing the wrecked coaches after the accident at Wath Road Junction, L.M.R., May 18, 1948

months. Assuming the rail to have reached solar maximum a theoretical expansion of $\frac{1}{8}$ in. in a 60 ft. rail would have been produced.

There was no reason to think that any defect in the engines, or coaches, could have contributed to the accident.

COURSE OF EVENTS

The train left Sheffield 6 min. late and passed Wath Road Junction at 3.51 p.m. The driver of the leading engine said he had a good run, but looking out just after passing the road bridge he saw that "both rails were badly distorted to the left, or near side. I should say the right-hand rail was very nearly in the centre of the track and both rails were symmetrical—a perfect kink in the road—I applied the brake to the full immediately I saw it . . ."

He remembered looking back and seeing the train engine topple over in a cloud of dust with coaches piling up. He felt no severe lurching or rolling coming round Wath curve. Track between Sheffield and Leeds was not as good as elsewhere on account of long lengths of ash ballast and colliery subsidences. Drivers experienced

The fireman of the goods train, above mentioned, whose engine was then $\frac{1}{2}$ mile from the scene of the derailment, saw the relief train raise a cloud of dust. Except for that it appeared to be travelling normally, and when his train moved forward he did not notice the down passenger line.

None of the drivers of the three trains previous to the relief express noticed anything out of the ordinary, but the driver of a 2-8-0 goods light engine, which passed the junction at 1.23 p.m., felt a roll when travelling along the embankment at 30 to 35 m.p.h. and some jumping at rail joints. He saw ashes rolling down, braked and looked back, but the track appeared to be in perfectly good order. He thought no more of the incident until asked for a report.

PERMANENT WAY

The ganger in charge, being at work in the colliery sidings, instructed a sub-ganger to walk the track in the morning of May 18, and, as it was very hot mid-day, to inspect the passenger lines again in the afternoon. He himself had walked the track on the previous day, between 7.30 and 9.30 a.m., when the down pas-

senger line was in good condition. A few keys were out, but sleepers were firm, rail joints wide and ranging from $\frac{1}{4}$ to $\frac{1}{2}$ in.

Some of the evidence of the sub-ganger was unreliable. He said he walked along the track, starting at 7.30 a.m. from Wath-on-Deerne Station northwards, returning along the down passenger line, reaching the south end at 10.30, when he returned to the station. After his dinner, he began his second inspection at 12.45 p.m., walking the 6-ft. space between the passenger lines. In the morning, rail joints were in good order, with gaps varying from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. They were still wide open in the afternoon, although it was much hotter; he did not slacken them. He noticed no loose sleepers. When the down relief express passed him 300 yd. north of the girder bridge, everything appeared normal. He was then too far away to see the track on the embankment.

The ganger gave details of the work done on the down passenger line. A section covering the point of derailment had been repaired commencing May 3, low spots being lifted, sleepers packed and alignment attended to. Ash ballasted track required more maintenance than the stone ballasted sections. Fishplates had been oiled early in March, but he admitted that some were only loosened and not removed then. It was a big job to take them all off. They became rusted by fumes from the coke ovens nearby. The section had been noted for re-ballasting since his 1946 report and booked for 1948 programme.

During the period immediately before the accident, his gang consisted of the sub-ganger and three, instead of five, lengthmen (including a temporary man for coal settlement work). The sub-ganger had been with him for two years and the most experienced lengthman had less than three years' service. Others were constantly changing. A lot of work was thrown on him and he was feeling the strain of training so many new men. He usually sent the sub-ganger to walk the track while he concentrated on training and doing important work.

The permanent way inspector, on leave at the time of the accident, last inspected on April 29 and considered the length in good condition generally. The best part of the ganger's length was between the bridges; it took a lot of looking after. The changing of lengthmen had affected the ganger's work to some extent. The sub-inspector, who saw the line on May 14, thought it generally satisfactory.

The Chief Permanent Way Inspector considered the down passenger track of "good strength," but it was not one of the best lengths. Track on ash ballast could not be maintained to the same standard as on stone; the foundation was not so strong, and joints in particular gave more trouble. The ash on the embankment was soft and had much clinker in it. However, he was satisfied that the line was safe for speeds of 75 m.p.h.

He thought that the rail joints inspected after the derailment were probably wider than they had been on the morning of May 18. He saw no signs of creep, but realised that the fishplates removed for inspection had not been properly oiled. Because of expansion, the rails were abnormally tight on the afternoon of that day. The relief express must have set up vibrations, which caused the distortion. Some years ago he had experienced a case of distortion under a train. On the morning of May 18, he sent a special reminder to his inspectors, drawing attention to the

need for special precautions, but this did not reach the ganger concerned in this case until May 20.

INSPECTING OFFICER'S CONCLUSION

The derailment was caused by severe distortion of the track, and the evidence of the guard and passengers on the relief express led to the conclusion that it was initiated by that train. Probably the rails were so highly stressed, that vibration and side thrust were sufficient to start the track moving laterally where ballast resistance was insufficient. Most of the train passed without ill-effect, but once the movement started it increased rapidly and shook violently the last coach. Probably the fine ash, loosened by repair work, was not fully consolidated and resistance to lateral movement was below normal.

If the sub-ganger's statements about width of joints in the afternoon are to be believed, the fishplates must have been so tight that the rails could not move. This was probably the case at some places, but on the morning of May 19, joints were found with gaps of only $\frac{1}{4}$ in. to $\frac{1}{2}$ in., insufficient to take up the full theoretical expansion caused by temperature rise of 80° F. It can be concluded that expansion was restricted, partly by tight fishplates and partly by butting joints.

Although the condition of the curves 200 yd. in rear had no direct bearing on the derailment, engine rolling may not have been entirely damped out by the time the point of it was reached. Wheel flange pressures set up by previous trains may have deflected the track slightly. This would add a lateral buckling component to the compressive rail stress, increasing with rising temperature, until instability eventually overcame ballast resistance.

On well-maintained track, distortion should not occur, even in the hottest weather, and responsibility rests on the members of the Engineering Department concerned. Had the sub-ganger examined the track more closely, he might have noticed tight fishplates and butting joints and realised the dangerous condition. The ganger realised the possibilities, but it would have been more prudent to have satisfied himself personally of the safety of the line in the afternoon. He was, however, handicapped by changes in staff, involving 17 new men in three years.

The condition of his length was not up to the requirements of a first class main line. He admitted that all fishplates had not been taken off at oiling, and some were too tight. He had been a ganger for just over a year, but had 29 years' service. His previous record was very good. The sub-ganger had only a little over two years' service, one year in that position.

Neither the Chief Inspector, Inspector, nor Sub-Inspector, appeared to have realised fully the weakness of dry soft ash ballast, nor had the Divisional Engineer any anxiety about the line, though all agreed that ash ballasted track was more difficult to maintain than stone ballasted. Brigadier Langley considers that they must all share responsibility for the accident, in view of the previously reported deficiency of ballast, and also that a speed restriction should have been imposed. Had the guard of the relief looked back immediately he might have seen the distortion, but he can hardly be criticised for failing to take such rapid action.

REMARKS AND RECOMMENDATIONS

Further research is needed into the strength of different types and conditions of ballast to resist lateral forces set up by highly stressed rails. Brigadier Langley

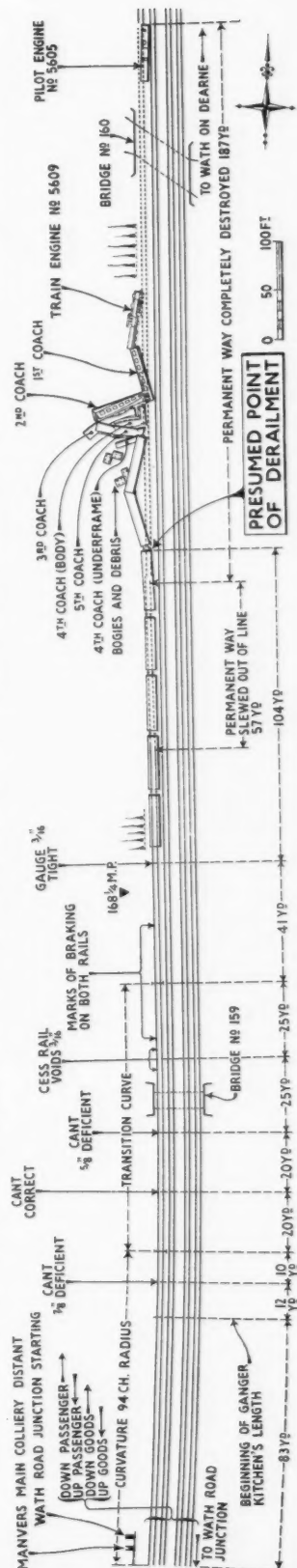


Diagram illustrating circumstances of the accident at Wath Road Junction, L.M.R., on May 18, 1948

attended some tests near the scene and first results confirmed that ash ballast of the type used there was considerably weaker than stone, and that its strength was further seriously reduced after disturbance caused by normal lifting and packing. He recommends that research be continued until relative strengths can be assessed with reasonable accuracy.

The condition of this ganger's length showed that the need for loosening fish-plates during hot weather, particularly at its onset, had not been fully appreciated. It is understood that all concerned have again been impressed with the necessity of taking all requisite precautions in future.

It is doubtful whether the Region's general maximum speed of 75 m.p.h. should be permitted with ash ballast, unless the track is thoroughly consolidated and maintained in first class condition with sleepers fully boxed and ample shoulders. The evidence confirmed the difficulty of achieving the necessary standard, and Brigadier Langley recommends that the condition of these lines be reviewed to ensure that maximums conform more closely to physical conditions. Substitution of stone for ash ballast is highly desirable and is being undertaken where formation is stable and where subsidences are not expected for some years.

Staff difficulties have been fairly general throughout Derby North District. Wide issues are affecting recruitment, but it is to be hoped that the difficulties will soon be overcome. Constant changes handicap the work and impair efficiency.

The Beira Railway Sale Approved

A resolution authorising the directors of the Beira Railway Company to sell its rights in Africa (except the Savoy Hotel at Beira) to the Portuguese Government for £4,000,000 was approved at an extraordinary meeting of the company on January 6. Details of the sale were given in our December 3, 1948, issue. Mr. A. E. Hadley, the Chairman, announced that the Board considered that it would be in the shareholders' interests to pass the resolution, and it was carried by eight votes to one. At an earlier meeting of holders of the Beira Railway certificates issued by the British South Africa Company, at which Sir Dougal Malcolm, Chairman of that company, presided, a poll was taken on the sale of the Beira Railway rights. The result was 138,135 votes in favour and 35,660 against.

Sir Dougal Malcolm said that the terms of the sale were fair. The Beira Railway Company could not operate the railway without acquiring all the necessary equipment, which he estimated would require about £3,000,000 of new capital. As the concession had only a few years to run it was most unlikely that this sum could be raised.

The Portuguese Government would acquire an annual income of about £8,000,000 for a capital outlay of £7,000,000, but would need to spend something like £9,000,000 for new equipment and on development. This meant that it would receive an annual return of 5 per cent., and even if an allowance for extra earnings on the development amounts were made, the annual return would probably not exceed 6½ per cent.

The net annual income of the Beira Railway, after all taxes, amounted to £80,000. If the £4,000,000 of purchase money was re-invested at 4 per cent. there

would be a return of £88,000 which would place shareholders in a slightly better position.

There was criticism of the sale by a number of certificate holders. One thought that the Beira Railway Company should retain the line and that the Chairman's estimate of capital outlay needed to operate the line was excessive, others that a statement should have been issued to check speculation in the shares, which at time changed hands at 65s. To the latter criticism the Chairman retorted that it would have been foolish during the period of negotiations to have said publicly what

he considered the shares worth. Some holders considered that longer notice of the meeting should have been given, but a motion to adjourn it for three months was ruled out of order.

A meeting of holders of Beira Railway certificates issued by Companhia de Moçambique was held immediately afterwards. To a question whether the outcome of the meeting would influence the voting at the Beira Railway meeting, Mr. V. L. Oury, who presided, replied that it would not. The resolution was passed on a show of hands, with only one dissentient vote.

C.I.E. Directors Reply to Sir James Milne's Report on Irish Transport

The five directors who, headed by the Hon. W. E. Wylie, K.C., as Deputy Chairman, represent stockholders on the board of Coras Iompair Eireann, have issued a memorandum examining the effect of Sir James Milne's report on the present "disastrous" position of stockholders, and replying to criticisms contained in the report. The memorandum, which was sent on January 6 to holders of C.I.E. common stock, conveys the opinion that the prospect of a dividend has receded still further as a result of the report, and it proposes that any Government reorganisation of C.I.E. should provide for paying off the common stockholders or guaranteeing them a dividend.

Pointing out that the Minister for Industry & Commerce had not accepted recommendations they had made in March, 1948, for increasing C.I.E. revenues, the directors say that everything they had then asked for has been agreed to by Sir James Milne. In regard to economies they had sought to effect, Sir James Milne had not agreed to closing branch railways and restriction of competition by private lorry owners, because "public policy" did not permit. This supported the point they had made to the Minister between April and June that private capital should not be used in an undertaking which, for reasons of public policy, could not be operated in such a way as to allow of dividends being paid.

"The tragic thing," adds the memorandum, "is that during the nine months which have elapsed since we made our request, another half-million has been lost." Of branch lines, the directors say: "Surely no clearer example of the clash between public policy and private enterprise could be found. 'You must keep the branch shop open, even if you are losing money' is a startling statement in an individualistic economy. One thing is certain: these findings about branch lines, if acted on, are a serious matter for the stockholders..."

Describing the matter of the restriction to be placed on private road goods transport as "this most vital issue," the directors declare that emphatically there are not enough customers for both road and rail. They refer to the limitations on private goods transport proposed in the report as "trying to stop a breach in an embankment with a cork." Sir James Milne's scheme for compelling private operators to pay wages equal to those of C.I.E. is called a "pious hope."

Sir James Milne's only dissent from the directors' recommendations on rehabilitation of the permanent way to enable higher speeds to be run, and replacement of existing carriages, wagons, and locomotives, is, says the memorandum, on the introduction of diesel-electric locomotives,

as he prefers coal-fired steam locomotives. The C.I.E. directors recall the difficulties of operating coal-burning locomotives in the years 1942-46 ("and who can guarantee that such a position will not occur again?") and say that five diesel-electric shunting locomotives now in use in C.I.E. yards are proving both economical and efficient.

As to other criticisms of capital expenditure, the memorandum says that all the schemes mentioned had the full approval of the Board "and had we been given the opportunity, we would gladly have stated the reasons which led us to the decision taken." The Board had understood that C.I.E. was established "to build up a sound transport organisation on a long-term policy and make it capable of ultimately manufacturing all its main requirements."

In a reference (to which Mr. John McCann, who is both a director of C.I.E. and Chairman of the Grand Canal Company, enters a disclaimer) to the recommended acquisition of the Grand Canal Company, the directors say they cannot see exactly why the shareholders of the canal undertaking should be paid off "while the C.I.E. stockholders are left to bear the brunt of further experiments in transport."

Of Sir James Milne's comments on the prospects—"taking the longer view"—of dividends being paid on C.I.E. common stock, the memorandum says the position is getting worse every day. "In the last three weeks," it points out, "we have lost almost £100,000, yet we are helpless to do anything," and asks if it is suggested that there was anything more the Board could have done in 1948 than was proposed in the letters to the Minister between April and June, 1948. The weekly bill for salaries and wages is now always over £150,000, whereas a 3 per cent. dividend on the remaining common stock (£3,500,000) would amount annually to £105,000.

Finally, the memorandum refers to the Board being given a "new freedom," as recommended in the report, with authority exercised by the whole Board rather than by the Chairman as at present. It asks whether the Board is to be bound nevertheless by other recommendations in the report, even where the opinions of Sir James Milne appear "unsound or not suitable to this country."

The memorandum which is signed by the Hon. W. E. Wylie, and Messrs. J. F. Costello, C. D. Hewat, John McCann, and H. B. Pollock, winds up by quoting without comment the last paragraph of the Milne Report on C.I.E., namely, "No discussion of the changes in policy and organisation proposed in this report has taken place with the Board of directors or officers of the company."

Canadian Pacific Results and Activities in 1948

Further rate increases are needed to meet rising costs and to build new equipment

Mr. W. A. Mather, President of the Canadian Pacific Railway, said in his annual statement that during 1948 the company, despite a record volume of traffic, did not share to the same degree in Canadian prosperity as other major industries. Rapidly mounting costs, with only partial compensation from the freight rate increase of March, 1948, had placed the company in a critical financial position.

To meet rapidly rising operating expenses, and construct sorely needed new equipment, adequate rate revenues are urgently needed. In 1948 gross earnings will be approximately three times those of the depression year of 1933, and net earnings are not expected to reach the figure of that year. Gross earnings increased \$27,294,371 from January to October 31, but working expenses climbed even faster at \$31,621,762, resulting in net earnings showing a decrease for the period of \$4,327,391. Continuation of this trend can only lead to serious financial consequences to the company and Canada as a whole.

To alleviate these critical conditions, the Board of Transport Commissioners, on March 30, 1948, granted the Canadian railways a general freight rate increase, with some exceptions, of 21 per cent., as from April 8. Excluding the excepted rates, the 21 per cent. increase averaged only 16 per cent. on the total volume of freight traffic. The benefits of this award were soon wiped out by the granting of a wage increase to all employees on July 14, 1948, of 17 cents an hour retroactive to March 1, adding \$27,223,000 to the wage bill.

Taken as a whole, materials have increased in the 1939-48 period 65 per cent. and wages by 70 per cent. Therefore there has been no alternative but to apply for further freight rate increases and make drastic economies. In July, 1948, application was made for an immediate interim increase of 15 per cent. on freight rates, with a request for an overall increase of 20 per cent. This was later revised in relation to steadily mounting costs, and, on December 7, a request was made for a 20 per cent. increase in rates.

Although expenditure has had to be curtailed to meet immediate financial obligations, plans for the improvement of equipment and services have been worked out consistent with financial ability to pay. The management is fully alive to the necessity for the railway industry to provide modern equipment and services at a period when Canada's national income and employment are at record levels. Few countries depend to the same extent on transport as Canada, and with domestic and export trade at a peak, every effort is being made by the railways, despite their financial plight, to match the advances which are being made along the whole Canadian economic front.

The equipment situation is not as satisfactory as it should be to meet present-day traffic requirements, mainly because shortages of steel and allied products made construction impossible during the war years and present financial results prohibit a volume of new construction. However, the Canadian Pacific floated a \$20,000,000 equipment trust issue early in 1948, and these funds will be used to

help buy equipment to provide better services until finances improve.

In addition to securing a variety of new rolling stock the company is keeping abreast of motive power developments, and arrangements were made in 1948 for the dieselisation of the Vermont lines. Approximately 100 diesel shunters are in service or on order. Expenditure of \$8,000,000 for a hump retarder freight yard in Montreal has been authorised.

The return of the *Empress of France* enabled a transatlantic shuttle service with the sister ship, the *Empress of Canada*, to be carried on. The *Empress of Scotland*,

now being reconditioned after war service, probably will join these ships in 1950.

During 1948 the company acquired the 10,000-ton *Beaverbrae*, a former German ship, which has brought 5,470 new settlers to Canada during the year. Two new ships for the British Columbia coast service, *Princess Marguerite* and *Princess Patricia*, will be in operation in 1949. In the Pacific the *Aorangi* returned to re-open the Canadian Pacific "All-Red" route from the United Kingdom to Australia.

Canadian Pacific Air Lines is preparing to operate from Vancouver to Australia, New Zealand, and the Orient. It is expected that the Australian service will begin about midsummer, 1949. A new route between Vancouver and Calgary, serving the Kootenay region of British Columbia, has been opened.

Canadian National Railways Presidential Review of 1948

Large orders for rolling stock have been placed, but shortage of materials continues

Mr. R. C. Vaughan, Chairman & President, Canadian National Railways, opened his review of 1948 by saying that the company had just concluded one of the most trying years in its history. When the final figures are available, even with a record-breaking gross income, the net position in 1948 will be the lowest since 1939, and insufficient to meet interest due on securities held by the public and owing to the government. Gross revenues for 1948 amounted to \$492,000,000, an increase of \$54,000,000 as compared with 1947. Operating expenses, at \$466,000,000, were \$69,000,000 higher, making net revenues for the year \$15,000,000 lower than those of 1947.

Rate increases added approximately \$30,500,000 to revenue during 1948, but they fall short of what is needed to take care of higher costs. On a conservative estimate increased wages and other benefits for employees and increased prices for materials added \$60,000,000 to expenses in 1948. Application for a rate increase of 20 per cent. is before the Board of Transport Commissioners.

In 1948, the Canadian National hauled an estimated total of 86,000,000 tons of freight, some 221,000 less than in the previous year. Although the railway originated more tonnage on its Canadian lines, there was a notable decline in traffic originating in the United States, mainly because of restrictions on imports. Approximately 20,800,000 passengers were carried, a decrease of 426,000. The total volume of parcels traffic exceeded that of any previous year. Because of the floods in the Spring, there was a decrease in both fruit and fish traffic from British Columbia, but this was offset by increases in fruit and vegetable traffic from Ontario.

An outstanding event was the entry of the new steamship *Prince George* into the Vancouver-Alaska service. Extensive damage to the company's properties in British Columbia and disorganisation of services resulting from widespread floods in the Fraser River valley and elsewhere in May and June cost several million dollars. Construction of the International Aviation Building adjoining the Central Station at Montreal proceeded according to schedule, and it is expected to be ready for occupation by next July.

Progress is being made in the construction of a branch to develop the Abitibi district of northern Quebec. It will cost about \$3,200,000, and will open for settlement farm land supporting 15,000 persons; the estimate of the capital wealth created by this extension is placed at approximately \$40,000,000.

In common with other railways on the continent, the Canadian National suffered from a shortage of equipment, experiencing at times difficulty in meeting demands of shippers. Through the co-operation of the Association of American Railroads, some relief was afforded toward the end of the year when the return of empty freight wagons from the United States to Canada was expedited.

Equipment builders delivered 6,477 freight wagons of all types. Freight equipment on order for 1949 includes 3,684 wagons. There are substantial orders for new equipment with the coach and locomotive manufacturers, but shortage of materials, particularly steel, and high cost of materials and wages continue.

Last June six diesel-electric road locomotive units, the first of their type in regular service in Canada, went into operation between Montreal and Toronto. Twenty-two units were delivered for the C.N.R. United States lines. Also received were six diesel shunters; 20 more are on order for 1949 delivery.

Questions in Parliament

Wagon-Building Programme

Lt.-Colonel M. Lipton (Brixton—Lab.) on December 17 asked the Minister of Transport to what extent the building of railway wagons was being held up; and to what extent the existing capacity for building was unused.

Mr. Alfred Barnes (Minister of Transport) stated in a written answer: The wagon-building programme for 1949 is limited by a shortage of materials. The spare capacity in railway shops will be used for repairing carriages which would otherwise be broken up, and for wagon repairs. I am advised by the Minister of Supply that contractors' capacity, which would otherwise be unused, will, so far as possible, be diverted to export.

Railways and the Factory Acts

Mr. M. Turner-Samuels (Gloucester—Lab.) on December 14 asked the Secretary of State for the Home Department if he intended, at an early date, either to amend the present Factories Acts, or to introduce new legislation to extend the provisions and regulations of those Acts, relating to health, safety, and welfare, and, as far as practicable, the employment of women and young children, to railways and offices so as to include all persons employed therein.

Major K. G. Younger (Parliamentary Under-Secretary of State for the Home Department) stated in a written answer: The matters in question are for the most part within the terms of reference of the Gowers Committee, the final report of which the Secretary of State hopes to receive by the end of this month. The report will have to be considered by the Government before he can make any statement as to legislation.

African Railway Survey

Sir Waldron Smithers (Orpington—C.) on December 15 asked the Secretary of State for the Colonies what salary he was paying to the 25 U.S. geologists to survey the coast-to-coast African railway; and what salary was offered to British geologists to do the work.

Mr. A. Creech Jones (Secretary of State for the Colonies), in a written answer, stated: No survey of a coast-to-coast African railway is at present in mind.

African Labour for Railway Construction

Mr. A. R. Hurd (Newbury—C.) on December 15 asked the Secretary of State for the Colonies if he would state the terms under which African labour was recruited for work on the new railway and port in Tanganyika; and to what extent conscription was used.

Mr. A. Creech Jones (Secretary of State for the Colonies) stated in a written answer: The terms of service are in line with those ruling in the district concerned at the time of recruitment and are agreed by the local Government. There is no conscription.

Notes and News

Designer Draughtsman Required.—A designer draughtsman, capable of undertaking calculation in reinforced concrete and steel frames. See Official Notices on page 55.

Quantity Surveyor Required.—A quantity surveyor, capable of writing specifications, mainly for civil engineering works, is required by a London drawing office. See Official Notices on page 55.

Canadian National Results.—An increase of \$1,943,000 in net revenue, all inclusive, for November, and a decrease of \$16,998,000 in the net revenue for the eleven months of 1948, as compared with corresponding periods of 1947, has been announced.

Institute of Transport, Metropolitan Graduate & Student Society.—At a meeting of the Institute of Transport, Metropolitan Graduate & Student Society, to be held at 80, Portland Place, W.1, on January 25, Mr. K. J. Lee will read a paper on: "Some Aspects of Handling Continental Passenger Traffic."

Strikes by Transport Workers.—In our issue of December 31 in an editorial entitled "State Transport's First Year," reference was made to "recent strikes at Stratford, Waterloo, Euston and Southampton." The recent dispute at Southampton did not concern any of the railway grades, but was confined to dockers and stevedores, who are registered with and controlled by the National Dock Labour Board.

London Hostel for Railwaymen.—British Railways have acquired for use as a hostel for railwaymen transferred to positions in the London area, premises known as the Hampden Club, 30, Polygon Road, London, N.W.1, close to Euston, St. Pancras, and Kings Cross stations, and a contract for carrying out essential repairs and alterations has been placed with G. & J. Waterman Limited, Watford. When completed the hostel will provide accommodation for over 300 railwaymen. There will be lounges, games rooms, clothes drying facilities, adequate bath-rooms and showers, and a meals service

to cover all turns of duty. As a first stage, sufficient accommodation will be completed to enable something like 100 railwaymen, who are living at present in converted railway coaches, to be transferred to the hostel.

British Railways, Southern Region, Lecture & Debating Society.—Mr. S. W. Smart, Superintendent of Operation, Southern Region, was in the Chair at a meeting of British Railways, Southern Region, Lecture & Debating Society, held on January 10, when Mr. C. F. Klapper, Assistant Editor of *Modern Transport*, read a paper entitled: "Some Examples of Suburban Traffic Operation."

U.S. Freight Loadings in 1948.—The Association of American Railroads estimates that 42,833,902 wagons of freight were loaded in 1948, a decline of 1,668,286 cars from the total loaded in 1947. No explanation was given for this 3.7 per cent. drop, but it is known that U.S. railways are watching the effect of increased lorry loadings on their freight volume. Freight traffic in 1948 was 43 per cent. above the pre-war peak in 1929, and that volume was the greatest for any peacetime year except 1947.

Barsi Light Railway.—Sir E. A. S. Bell, Chairman, presiding at the annual meeting of the Barsi Light Railway Company on December 2, said that the number of passengers carried increased by just over 250,000, but the tonnage of goods carried fell by 30,200 tons. The net earnings, before allowing for taxation, at Rs. 12,18,589 compared with Rs. 15,55,910 in the previous year. It has been decided to transfer £22,000 to renewals reserve, maintain the dividends at 6½ per cent., and increase the carry-forward from £16,634 to £22,050. The results could be considered not unsatisfactory in view of the difficult year through which they had passed.

Mechanical Mining Films.—A showing of mechanical mining films has been arranged for January 15 at the Dover Technical College, Dover, at 6.30 p.m., to members of the Kent Sub-Branch of the Association of Mining Electrical & Mechanical Engineers. Arrangements for the showing have been made by Mr. H. G. Harwood of Hugh Wood & Co. Ltd., a firm which has supplied mining machinery and equipment to the Kent coalfield. The films to be exhibited have been produced by the Big Six Film Unit, and are: "G.B.40," an instructional film about the most modern method of coal conveying underground, and "In the Forest of Dean," the story of coalmining in the Forest of Dean. The chair will be taken by the branch President, Mr. W. Hudson, and the producer of the films, Mr. E. Cook, will be present to address the audience.

Guild Formed by Irish Transport Executives.—A number of executives of Coras Iompair Éireann recently formed the Irish Transport Officers' Guild, on lines similar to those of the British counterpart. Major E. C. Dunne is Chairman; the Honorary Secretary is Mr. A. Reid; and the Honorary Treasurer, Mr. R. McCreadie. It is reported that the majority of eligible C.I.E. executives have already joined. Membership is confined, for the present at any rate, to C.I.E. The objects include improvement of conditions and safeguarding of rights of members; promotion of discussion, and interchange of ideas between members "which may lead to the more efficient and economic working of the transport systems in Ireland"; and bringing such

Siamese Government Mission Visits Loughborough



Members of the Siamese Government Mission, whose arrival in Great Britain was reported in our December 3, 1948, issue, recently visited the Loughborough works of the Brush Electrical Engineering Company, and are here seen alongside a Petters-Brush diesel-electric shunting locomotive

OFFICIAL NOTICES

None of the vacancies on this page relates to a man between the ages of 18 and 40, inclusive, unless he, or she, is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

LONDON Drawing Office. Required. Designer Draughtsman capable of undertaking calculation in reinforced concrete and steel frames, also in respect of general constructions. Knowledge of engineer's quantities. Possibility taking charge small group of draughtsmen. Salary 10-12 gns. per week.—Box 255, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

LONDON Drawing Office. Required. Quantity Surveyor capable writing specifications, mainly for civil engineering works, but including some architectural items. Salary 10-12 gns. per week.—Box 254, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20s. By post 20s. 6d.

THE EVOLUTION OF RAILWAYS. Second edition, revised and enlarged. By Charles E. Lee. Traces the germ of railways back to Babylonian times. Cloth. 8½ in. by 5½ in. 72 pp. Illustrated. 6s. By post 6s. 4d.

Western Australian Government Railways Commission

APPLICATIONS are invited and should be sent to the Agent General for Western Australia, Savoy House, 115-116, Strand, London, W.C.2, on or before January 24, 1949, for the following positions:—

COMMISSIONER OF RAILWAYS.

Salary of £3,000 (Australian currency) per annum. Applicants should have a comprehensive knowledge and experience in the management, maintenance, and control of Railways.

ASSISTANT COMMISSIONER.

Salary of £2,000 (Australian currency) per annum. A comprehensive knowledge and experience in the conduct of the commercial, traffic, and accounting aspects of Railway administration and control is required.

ASSISTANT COMMISSIONER.

Salary of £2,000 (Australian currency) per annum. The applicants for this position should be qualified Engineers (Civil and/or Mechanical) and have a thorough knowledge and experience of engineering in relation to the management, maintenance, and control of Railways.

Applicants should provide full information of age, marital state, experience, and technical and academic qualifications.

The successful applicants will be permanently appointed under conditions which provide for long service leave and superannuation benefits to a maximum of £650 (Australian currency) per annum on the basis of 40 per cent. provided out of personal contributions and 60 per cent. by the State on retirement at age 60 (optional) or 65 (compulsory).

S. A. TAYLOR,

Public Service Commissioner,
Western Australia.

REQUIRED for Consulting Engineer's London Office, a Locomotive Engineer, aged 25-30. Applicants must have been trained on a British Railway and possess good technical qualifications and a good knowledge of locomotive design and construction. They should preferably be members of the Institution of Mechanical and/or Locomotion Engineers. Pay according to qualifications and experience. Apply in writing, giving full particulars of age, qualifications and experience to: RENDEL, PALMER & TRITTON, 125, Victoria Street, London, S.W.1.

THE ABC RAILWAY GUIDE of London requires an experienced Advertisement Office Manager. Knowledge of hoteliers' requirements, ability write good space selling letters, and able take responsibility of advertisement "make-up" essential. Only written applications giving full details in confidence of past experience entertained.—THOMAS SKINNER & Co. (PUBLISHERS) LTD., 330, Gresham House, Old Broad Street, London, E.C.2.

THE RAILWAY SYSTEM OF JAMAICA. A general description of the system and its traffic, with an account of economic problems; the motive power used, and some features of operation. By H. R. Fox, B.Sc., M.Inst.C.E., General Manager, Jamaica Government Railway. Reprinted from *The Railway Gazette*, January 5 and 12, 1945. Price 1s. Post free 1s. 2d.

FIRST PRINCIPLES OF RAILWAY SIGNALLING. By C. B. Byles. Most treatises on railway signalling are intended for the railway signal engineer, but this is an elementary treatise. Cloth. 7½ in. by 5 in. 146 pp. Illustrated. 4s. By post 4s. 3d.

ideas, suggestions, or criticisms to the notice of the relevant authorities. There is a council of ten, and provision is made for representation from provincial districts. The offices of the Guild are at Bank of Ireland Chambers, Westmoreland Street, Dublin.

Great Western of Brazil Railway.—It has been announced by the Directors of the Great Western of Brazil Railway Co. Ltd. that the committee appointed under the Scheme of Arrangement have extended the moratorium period until December 31, 1949, in respect of the 5½ per cent. debentures and permanent 6 per cent. debenture stock.

London Busmen Overtime Dispute.—Representatives of the London Transport Executive and the T.G.W.U. decided on Tuesday to make a joint request to the Minister of Labour to appoint an independent arbitration tribunal to consider the claim by 56,000 bus and tramway workers for time-and-a-half pay for working Saturday afternoons. The original claim was refused by the Executive, and in defiance of union leaders more than two-thirds of the men stopped work on Saturday January 1. Later, the employees decided to submit the claim to arbitration. Transport workers elsewhere have made a similar claim.

Expansion of Thos. W. Ward Limited.—Mr. Ashley S. Ward, Chairman, presiding on November 26 at the annual general meeting of the company, whose financial results for the past year were given in our November 26, 1948, issue, said that the turnover of the parent company was £12,500,000 last year, which represented an increase of about £2,000,000 over the previous twelve months. Business in the repair of railway wagons had grown to the extent that they had had to increase the number of repair depots. Other interests of the firm, such as machine tools, power plant, cranes, mechanical and structural engineering, etc., also had played an important part in the successes achieved during the year. It was apparent that the Government was determined to go ahead with the nationalisation of iron and steel. The industry at

the present time was manifestly efficient—perhaps to a greater degree than ever before—and to suggest that the current shortage of steel was due to lack of foresight was a misrepresentation of facts in an endeavour to provide an excuse for further State control.

Export of Hungarian Rolling Stock to Pakistan.—A recent report of the Hungarian Commercial Attaché at Karachi, drawn up as part of the efforts made by Hungary to develop trade with Pakistan, stresses the possibilities open to the Hungarian railway industry of supplying rolling stock, locomotives, and other railway material to Pakistan.

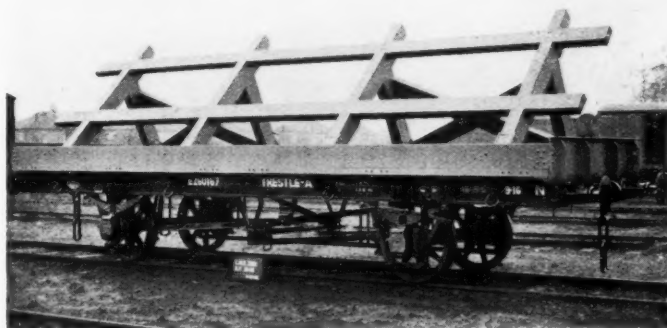
Electrical Equipment for Australia.—More than 1,000 tons of electrical equipment for shipment to Australia are being conveyed to Swansea Docks by the Western Region of British Railways from the local works of the British Aluminium Company. Eighteen transformers, which total 452 tons in weight, with a 20-ton pressure tank already are at the dock-side, while 600 tons of cased equipment comprising rectifiers and switch gear are

now being moved. Besides carrying out the transport arrangements by rail and road the Western Region dismantled the pressure tank and drew out the transformers from their positions at the factory.

Russian Loading Plan.—Mr. B. P. Beshchev, Soviet Minister for Railways, reported that, by December 18, 1948, the railways had fulfilled the annual loading plan ahead of time. Loadings increased by 20 per cent. as compared with 1947. Production costs were cut by 3.2 per cent. in the first eleven months of the year, before the time set by the plan.

Radio Tests on British Railways.—Tests with radio to ascertain whether it would facilitate any traffic or engineering operations are to be carried out by British Railways. In addition to fixed radio stations, tests will be carried out with transportable equipment, including portable sets for use on vehicles and by staff on the ground. The tests envisaged will determine the possible value of wireless for communication between shunting-engine drivers, ground staff and control

Trestle Plate-Wagon



First of British Railways double-bolster wagons converted for carrying steel plates

towers in marshalling yards. Other applications that will be tested include communication between staff during extensive engineering operations and from a central depot to road cartage collection and delivery vans. Working trials will take place as soon as the radio equipment now on order becomes available. Tests also are in hand, using ultra-high-frequency to determine the possibility of providing radio communication through tunnels, to facilitate engineering operations in these difficult locations.

Forthcoming Meetings

January 14 (Fri).—Institution of Railway Signal Engineers, at the London Transport Executive Signal School, Earls Court Station, London, S.W.5, at 6.15 p.m. "Principles of Power Point Detection and Control," by Mr. H. W. Hadaway.

January 14 (Fri).—Railway Students' Association, London School of Economics & Political Science. Visit to Lots Road Power Station, at 6 p.m.

January 14 (Fri).—Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 6 p.m. Applied Mechanics Group: Discussion on "Screw Threads and Loaded Projections." Papers on: "The Distribution of Load in Screw Threads," by Dr. D. G. Sopwith; "Tensile Fillet Stresses in Loaded Projections," by Dr. R. B. Heywood.

January 15 (Sat).—British Railways, Southern Region, Lecture & Debating Society. Visit to Tilbury docks, commencing at 2.25 p.m.

January 15 (Sat).—Permanent Way Institution, Manchester & Liverpool Section, at the City Technical College, Byrom Street, Liverpool, at 2.30 p.m. "The History of the Permanent Way," by Mr. W. Cliffe.

January 19 (Wed).—Railway Students' Association, London School of Economics & Political Science. Visit to Lots Road Power Station, at 6 p.m.

January 19 (Wed).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 5.30 p.m. "The Electric Locomotive in Switzerland, its latest Development, Mechanism and Some Problems," by Dr. Gaston Borgeaud, Chief Engineer, Swiss Locomotive & Machine Works.

January 19 (Wed).—Permanent Way Institution, London Section, at Denison House, 296, Vauxhall Bridge Road, S.W.1, at 6.30 p.m. "Fastenings," by Mr. A. Savill; "Maintenance & Measured Packing," by Mr. F. Lloyd; "Length Marking and its Effects on the Permanent Way Man," by Mr. W. T. Thornevell.

January 20 (Thu).—Institute of Welding, North London Branch, at the Polytechnic, Regent Street, at 7.30 p.m. Presidential Address.

January 20 (Thu).—Diesel Engine Users Association, at Caxton Hall, Westminster, London, S.W.1, at 2.30 p.m. "Recent Developments in Medium Speed Two-Cycle Oil Engines," by Mr. C. B. M. Dale.

January 20 (Thu).—British Railways, Western Region, London Lecture & Debating Society, at the Clerks' Dining Club, Bishop's Bridge Road, Paddington, at 5.45 p.m. "Staff Welfare on the Railways," by Mr. C. Humphries, Chief Welfare Officer, Western Region.

Railway Stock Market

Although the general volume of business improved, the Palestine news had a restraining influence at the beginning of the week. Subsequently buyers predominated, investment trusts and financial institutions still favouring long-dated stocks, such as 2½ per cent. Consols and Treasury Bonds. Transport 3 per cent. (1978-88) changed hands up to 100½ and Transport 3 per cent. (1968-73) was 102½. Other sections attracted selective demand, although it was being pointed out in the City that there is little prospect of the next Budget bringing any material relief in the tax burden. On the other hand, the F.B.I. memorandum presented a strong case for taxation reforms, and it is hoped that there may be some minor concessions next April in respect of the Profits Tax, and, perhaps, in regard to dividend limitation and Bonus Tax. Hopes that these measures may be abolished seem too optimistic at this stage.

The pending visit to London of Senhor Machado has kept alive hopes of take-over developments shortly in respect of both the Great Western of Brazil and Leopoldina railways. It is also hoped that there may be a speeding up of the compensation decision in respect of San Paulo "unrecognised" capital. It is realised, of course, that in the event of take-over of the Great Western and Leopoldina railways, the question of compensation might take a long time to settle, and might not be finally decided before the end of this year. Meanwhile, however, there is a tendency for activity in the stocks of these companies to revive once more. In responsible quarters, it is pointed out that both the ordinary and preference stocks of the Leopoldina must be regarded as a pure speculation even allowing for the fact that current levels seem moderate, assuming reasonably fair take-over terms. Hopes of a "fair deal" in matters of this sort frequently fail to be realised. Leopoldina debentures at current

prices are a good deal less speculative than the ordinary and preference stocks. At the time of writing the ordinary have fluctuated moderately around 10½, the preference around 36, while the 4 per cent. debentures were 80, and Leopoldina Terminal 5 per cent. debentures 72. Great Western of Brazil shares have strengthened to 109s. San Paulo ordinary stock was firmer at 163. In other directions Beira Railway bearer shares rallied to 47s. on further consideration of the statements at the meeting. Canadian Pacific eased to nearly 23½ on news stressing the need for higher tariffs.

Antofagasta stocks firmed up after earlier small declines. The ordinary was 9½ and the preference 56. Central Uruguay ordinary improved to close on 12 and Mexican Railway 6 per cent. debentures improved to 84½. United of Havana 1906 debentures at 13 were dull on the financial results and the hint of a further recasting of the capital in due course. Manila Railway "A" and "B" debentures fell to 85 and 86 respectively and the preference shares to 8s. 9d. on news that a further scheme of arrangement is being considered.

Iron and steel shares remained a quiet market and Guest Keen eased to 49s. Vickers, after their recent jump to 34s., have come back to 33s. 4½d., but Babcock & Wilcox held their rise to 74s. 6d. Colliery shares quietened down. Shares of locomotive builders and engineers were little changed on balance. North British locomotive 5 per cent. preference have marked 24s. 9d. and Charles Roberts 6½ per cent. preference were dealt in up to 37s. Gloucester Railway Carriage ordinary shares have been dealt in up to 63s., while Cammell Laird 5s. ordinary, after receding, attracted buyers at 17s. 9d. Beyer Peacock and North British Locomotive ordinary were 24s. and 24s. 6d. respectively and Vulcan Foundry 27s. 3d. Pullman Car "A" have been more active around 21s. 6d. G. D. Peters 5s. shares marked 17s. 6d.

Traffic Table of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date		
			Total this year	inc. or dec. compared with 1947-48		Total	Increase or decrease	
						1948-9		
South & Central America	Antofagasta...	811	2.1.49	£ 62,140	+ £ 21,610	1	£ 62,140	+ £ 21,610
	Bolivar	174	July, 1948	\$28,960	- 869,357	30	\$471,287	- \$301,893
	Brazil							
	Cent. Uruguay	970	6.11.48	32,712	+ 2,978	18	595,105	- 7,652
	Costa Rica	281	No., 1948	35,992	+ 1,696	22	179,839	+ 17,492
	Dorada	70	Nov., 1948	32,667	+ 8,367	48	305,908	- 19,292
	G.W. of Brazil	1,040	31.12.48	34,900	+ 9,300	52	1,780,900	- 15,300
	Inter. Ctl. Amer.	794	Nov., 1948	\$1,094,493	+ \$44,021	48	\$12,165,251	+ \$211,814
	La Guaira	22½	Dec., 1948	\$115,163	+ \$25,985	52	\$1,273,516	+ \$19,091
	Leopoldina	1,920	25.12.48	64,952	- 4,120	51	2,870,486	- 514,553
	Midland Uruguay	319	Sept., 1948	19,608	+ 3,123	12	67,355	+ 16,721
	Nitrate	382	31.12.48	18,274	+ 7,843	52	318,348	+ 89,730
	N.W. of Uruguay	113	Sept., 1948	5,686	- 1,23	12	16,335	+ 1,989
	Paraguay Cent.	274	31.12.48	\$100,501	+ \$36,603	26	\$2,705,096	+ \$1,057,301
	Peru Corp.	1,059	Dec., 1948	265,440	+ 21,029	26	1,160,130	+ 134,011
	Salvador	100	Oct., 1948	\$82,000	+ \$1,400	18	\$329,000	+ \$13,400
San Paulo	153½							
Taltal	156	Nov., 1948	6,790	- 1,290	22	38,520	+ 6,170	
United of Havana	1,301	1.1.49	\$228,932	+ \$33,072	26	\$5,618,696	+ \$2,069,227	
Uruguay Northern	73	Sept., 1948	1,072	+ 52	12	3,308	+ 111	
Canada	Canadian National...	23,473	Aug., 1948	10,110,000	+ 855,250	35	77,676,250	+ 5,854,000
	Canadian Pacific	17,037	Nov., 1948	8,533,000	+ 1,724,250	48	81,043,000	+ 8,547,750
Various	Barsi Light†	202	Nov., 1948	39,090	+ 12,360	35	220,792	+ 20,077
	Beira	204	Oct., 1948	126,338	+ 10,322	4	126,338	+ 10,322
	Egyptian Delta	607	20.11.48	33,131	+ 21,798	34	455,932	+ 91,614
	Gold Coast	536	Nov., 1948	246,162	+ 84,582	35	1,648,016	+ 459,522
	Manila							
	Mid. of W. Australia	277	Oct., 1948	31,467	+ 8,707	18	113,713	+ 25,391
	Nigeria	1,900	Sept., 1948	412,268	+ 62,429	25	2,617,491	+ 531,086
	Rhodesia	2,445	Sept., 1947	643,980	+ 102,833	52	6,787,603	+ 612,938
	South Africa	13,347	25.12.48	1,395,448	+ 234,879	39	51,885,278	+ 3,215,733
Victoria	4,774	June, 1948	1,358,791	+ 248,144	52			

* Receipts for 4 days in 1947 and 6 days in 1948

† Receipts are calculated @ 1s. 6d. to the rupee